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1.	<b>A study to assess the effectiveness of the structured teaching plan about knowledge regarding nosocomial infection among nurses in selected hospitals.</b> Mrs.Jayashree Rajesh Salvi	4-7
2	<b>A study to assess the experience of Nursing supervisors and students about Objective Structured Clinical Examination (OSCE) as new method of clinical teaching in selected hospital of Metropolitan city.</b> Name - Mrs. Shweta Saisagar Kshirsagar	8-14
3	<b>Establishment of in-vitro-in-vivo relationship for immediate release tablet dosage form of linagliptin and metformin hydrochloride</b> Sukanta Chatterjee	15-24
4	<b>A STUDY ON PRETERM INFANTS ADMITTED IN NICU TO ASSESS THE EFFECTIVENESS OF NON NUTRITIVE SUCKING IN IMPROVEMENT OF SUCKING REFLEX.</b> Mr. Manoj Swarnkar	25-32
5	<b>Effectiveness of structured teaching programme on knowledge and attitude regarding teenage pregnancy among adolescent girls in a selected high school of rural and urban area, Bangalore.</b> Ashwini M R <sup>1</sup>	33-40
6	<b>IMPORTANCE OF DIGITAL LIBRARY AND INFORMATION IN MORDEN EDUCATION AND RESEARCH</b> Jayashree Vijay Parab	41-48
7	Isolation and characterization of saline soil action-bacteria producing pectinase and its antibacterial activity Sonalı Bhagat	49-54
8	<b>Pilot study report on impact of Awareness Teaching Programme on behavioral outcomes regarding sexual violence among adolescent girls from selected schools of Bangalore</b> Mrs. Usha Rani.R	55-59
9	<b>Effect of communication board on selected parameters of comfort in ventilated clients in selected hospital at Bangalore</b> P.Sivamaran	60-62
10	Plastic Injection Moulding Process and Its Aspects for Quality P. Durga Ravi Prasad	63-68
11	<b>EFFICACY OF ALTERNATIVE THERAPY ON BEHAVIOURAL OUTCOMES REGARDING MANAGEMENT OF MINOR AND MAJOR DISORDERS IN PREGNANCY AMONG PRIMIGRAVIDA MOTHERS FROM SELECTED GOVERNMENT HOSPITALS OF CHITRADURGA</b> Smt. V. Anusuyamma	69-77
12	<b>AN APPROACH ON DYNAMICS AND ECONOMY OF GROUNDWATER RESOURCES IN HARYANA</b> Pinki Rani	78-85
13	<b>DEVELOPMENT AND SYNTHESIS OF SILVER NANO PARTICLES USING DIFFERENT TESTING CONDITIONS</b> Minakshi	86-90
14	<b>Cardiovascular Health Risk Behavior among Youths: A Review.</b> Prof. Raju Chaganrao Sarvade	91-93
15	<b>Effectiveness of inserting Chilled Nasogastric tube on Level of comfort of Patients admitted in a Selected Hospital at Mangalore</b> Sholy Rose Paruvanani	94-101
16	<b>3D Object Detection Using Marginal Space Learning in medical images</b> QURRATUL AINI	102-105
17	Study of Plastics in Injection Moulding Process P Durga Ravi Prasad	106-114

18	<b>A Survey Paper on Automatic Speech Recognition</b> Mr.Bere Sachin Sukhadeo	115-123
19	<b>Video Retrieval using Textual Queries and Spoken Text</b> Mr.Bere Sachin Sukhadeo	124-130
20	<b>A REVIEW OF SOLVING TRANSPORTATION PROBLEMS</b>  NARENDRA SWAMI	131-141
21	<b>Current Status of Resarch in Artificial Intelligence field</b>  Ms.Rupali.A.Zamare	142-146
22	<b>PONGAMIA PINNATA-AN OVERVIEW</b>  SHANTHI MV	147-151
23	<b>Cloud Computing and Its Salient Features</b>  Dileep Singh	152-154
24	<b>Cost Benefit of a Rice Plant</b> Amardeep Singh	155-159
25	<b>DISTRIBUTED MOBILE AND STATIC WIRELESS SENSOR NETWORK</b>  NIKHATH TABASSUM	160-164
26	<b>FORMULATION AND EVALUATION OF TRANSDERMAL PATCH OF DANAZOLE</b> Nitin Singh	165-169
27	<b>A Descriptive study on Cardiovascular complication and risk factors in the Urban Areas of Delhi and NCR amidst Covid-19</b>  Shiny Chacko	170-174
28	<b>Fast Dissolving Tablet: A Promising Drug Delivery System along with Anti-epileptic Drug</b>  Md. Semimul Akhtar	175-184
29	<b>HOW ALCOHOL RUINS MARITAL RELATIONSHIPS</b>  Mr. Abhishek Jacob	185-187
30	<b>ROLE OF NURSE IN DIABETES MELLITUS</b>  Mrs. Shefali Charan	188-190
31	Re-opening of libraries in the Pandemic Covid-19: Challenges and Planning  Vitthal. A. Naikwadi	191-193
32	<b>Synthesis of metal chelate of Co(II) and Ni(II) with ligand 2-amino-3-chloro-1,4-naphthoquinone-1 oxime and their structure elucidation study &amp;Antimicrobial Activity.</b>  Suryakant B Dhawale	194-201
33	<b>MESOIONIC SYDNONE: A STUDY OF THEIR CHEMICAL AND BIOLOGICAL PROPERTIES</b>  Shanta Sharma	202-206
34	<b>THE STUDY OF PULMONARY AND EXTRAPULMONARY TUBERCULOSIS</b>  ASARAF ALI	207-213
35	<b>PHYSIO-CHEMICAL INVESTIGATIONS OF GROUNDED WATER IN RURAL AREA OF BHIWANI (HARYANA) REGION</b> SHANTA SHARMA	214-217
36	<b>FOETAL WELLBEING IN HIGH RISK PREGNANCY</b> MISS MONIKA	218-221

37	Application of ICT Uses and E-Resources in Academic Libraries. Sarika Bhagwanrao Rengunthwar	222-226
38	IMPACT OF STRUCTURED TEACHING PROGRAM ON KNOWLEDGE OF LIFE STYLE MODIFICATION IN CARDIAC PATIENTS FOR MAINTAINING HEALTHY HEART : A QUASI-EXPERIMENTAL STUDY AT JAYADEVA INSTITUTE OF CARDIOVASCULAR SCIENCES AND RESEARCH CENTRE BENGALURU. Vanaja Muniswamy	227-231
39	A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING UNIVERSAL PRECAUTION TECHNIQUE AMONG B.Sc. NURSING 1st YEAR STUDENTS OF BABA COLLEGE OF NURSING, CHINHAT, LUCKNO Lubna1,Sunita Singh2	232-239
40	Preventative measures to combat third wave of COVID-19 in India Sonia Singh	240-244
41	Use of Library with English and Other Language Literature: The Comparative Study Ashish v chaudhari	245-249
42	Preliminary Phytochemical Analysis of Various Extracts Of Mesua Ferrea L. Seeds SARI S NAIR	250-254
43	INRTODUCTION, ADVANTAGES AND USES OF WEDM - A REVIEW BAL KRISHNA TIBREWALA	255-258
44	INFORMATION SEEKING BEHAVIOUR AMONG THE STUDENTS IN SELECTED LIBRARIES COLLEGES Ms. Vijaya V. Sawant	259-263
45	A study to evaluate the effectiveness of information guide sheet on knowledge regarding pneumonia in relation to COVID 19 among residents in selected areas at Mysore Biji Kuriakose	264-268
46	DEVELOPMENT & VALIDATION OF RP-HPLC TECHNIQUE FOR ESTIMATING RIVAROXABAN IN PHARMACEUTICAL DOSAGE FORMS Jabeen Farhana	269-274
47	Generic steps to implement an NLP project from any field Sujitha Mohan	275-279
48	Study of the Convergence of Text Mining with NLP Techniques Suvarna S. Kannav	280-284
49	Manual Dexterity, Aging and its Clinical Implications Manju Unnikrishnan1	285-289
50	A descriptive study among women regarding management of diarrhoea in children Mr. Bheemraj Prajapat	290-294
51	A descriptive study among ANM students regarding tuberculosis management in children Narendra Singh Solanki1	295-300

## **A study to assess the effectiveness of the structured teaching plan about knowledge regarding nosocomial infection among nurses in selected hospitals.**

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### **OBJECTIVES OF THE STUDY**

- 1.To assess the knowledge of nurses regarding prevention of nosocomial infection after the structured teaching plan.
- 2.To compare the pre-test knowledge and post-test knowledge of nurses regarding prevention of nosocomial infection

### **HYPOTHESIS**

H0-There is a no significant changes in the level of knowledge of nurses after the implementation of structured teaching plan on prevention of nosocomial infection

H1-There is a significant changes in the level of knowledge of nurses after the implementation of structured teaching plan on prevention of nosocomial infection

### **RESEARCH APPROACH**

In this study, research approach is quantitative in nature.

### **RESEARCH DESIGN**

A pre-test observation of the dependent variables is made before implementation of the treatment of the selected group, the treatment is administered, and final post test observation of dependent variables is carried out to assess the effect of treatment on group.

The research design used is one group pre- test post test design.

### **SETTING OF THE STUDY**

The study was proposed to be conducted in private hospital in Mumbai, K.J Somaiya Hospital and Research Centre.

### **POPULATION**

The population of this study were the nurses of K.J. Somaiya Hospital And Research Centre.

### **SAMPLE**

The samples consists Nurses who were available at the time of data collection at K.J Somaiya Hospital.

## **SAMPLE SIZE**

Sample size for this study was 30 and 1/10 samples were taken for the pilot study. The tools that are used in particular field or activities different designation such as. CAUTI. prevention check list, observation checklist and opinion naire etc. for the data collection the content validity. The tool was scrutinized by 9 nursing faculty with certain modification and rearrangement done.

## **PILOT STUDY**

The pilot study was conducted in K.J Somaiya Hospital and Research Centre on 4th January 2020. The investigator took three samples to assess the knowledge regarding infection control and time taken for pilot study in three days. Analysis of the pilot study was done. Reductions and modifications of questionnaires were also done. Three samples of the pilot study were excluded from the samples.

## **MAIN STUDY**

The data gathering process was done on 4<sup>th</sup> January 2020. The researcher visited the Matron Madam to obtain the necessary permission from the concerned authorities. The nurses were informed the nature of the study so as to ensure better Co- operation during the data collection. A written consent was also taken from each of the participant as per language preference. A total of subjects were selected as per the availability of samples in the hospital. Then they were explained about the purpose of the study and how it would be beneficial for them. Researcher enquired their willingness to participate, made them comfortable and oriented them to the study.

## **MAJOR FINDINGS OF THE STUDY**

Major findings related to Demographic variables:

The result related to demographic data shows that as out 30 sample maximum sample 12(40%) belonged to age group of 20-25years, followed by sample 08(2.6%) in age group of 25-30years, 07(23.4%) belongs to age group of 30-45years. Maximum of 03(10%) samples belongs to the age group 45year. The result shows that educational qualification in a demographic data a nurses out of 30 samples maximum samples 29(96.9%) belonged to the GNM course followed by sample 01(3.4%) belongs to the other courses. There were no any samples of B.Sc. Nursing and ANM Nursing courses. The result shows that professional experience in a demographic data of nurses out of 30 sample maximum sample 17(56.6%) has clinical experience of 0-5 years followed by sample 09 (30%) has working experience of more than 15 years, 03(10%) has working experience of



5+10years. Minimum of 01(3.4%) samples has work experience of 10-15 years. The result shows that per area of experience. In a demographic data of nurses, out of 30 samples maximum samples of 13(43.2%) has area of experience to different specific area followed by samples 07(23.4%) has area of experience of surgical ward, samples 05(16.7%) has area of experience of medical ward and ICU. The result related to demographic data shows that out of total subjects maximum sample 26(66.6%) were registered staff nurses followed by samples 02(6.7%) were senior staff nurses, 02(6.9%) were at other post. No any sister-in charge was found.

Major findings related to Knowledge:

It was observed that pre-test score is 40% and mean is 14 and post-test score is 60% and mean is 15.

## SECTION-1

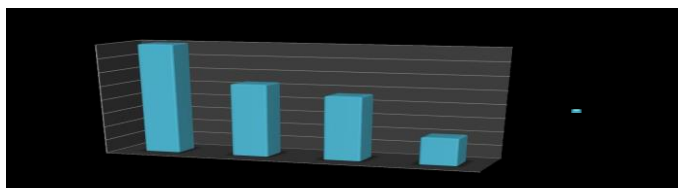
### PART-1: Classification of demographic characteristics.

Table: Distribution of respondent by Age.

N=30

Characteristics	Category	Respondents	
		Numbe	Percent
Age Groups (years)	20-25	12	40%
	25-30	08	26.6%
	30-45	07	23.4%
	>45	03	10%
		30	100%

Tableno.2 Distribution of samples as per age



This figure shows distribution of sample according to their demographic data such as age. In a demographic data of nurses, out of 30 sample, maximum sample 12(40%) belonged to age group of 20-25years, followed by sample 08 (26.6%) in age group of 25-30 years, 07(23.4%) belongs to age group of 30-45 years. Minimum of 03 (10%) samples belongs to the age group above 45 years.

### ANALYSIS OF THE DEMOGRAPHIC DATA

In this study, the tool used was semi-regular structured questionnaire after an extensive review of literature.

### Section A: Demographic

data Professional

experience Professional qualification

Area of experience Designation

Section B: It consists of 20 semi- structured questions to assess the knowledge regarding prevention of nosocomial infection.

The questions were divided into the following:-

General information and incidence Risk factor sand causes

Modes of nosocomial infection Prevention of infection.

### **ANALYSIS OF THE COMPARISION BETWEEN PRE TEST KNOWLEDGE SCORE AND POST TEST KNOWLEDGESCORE**

The pre-test knowledge score was 40% and mean is14and post-test score is 60% and mean is15.

### **SUMMARY**

The following conclusion was drawn from the study:

It was observed that the nurses did not have excellent knowledge about nosocomial infection. The knowledge and practices should be improved so as to prevent nosocomial infection.

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## **A study to assess the experience of Nursing supervisors and students about Objective Structured Clinical Examination (OSCE) as new method of clinical teaching in selected hospital of Metropolitan city.**

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### **ABSTRACT**

#### **Aim:**

- 1.To assess experience of Nursing students about Objective Structured Clinical Examination (OSCE)
- 2.To assess experience of Nursing supervisors about Objective Structured Clinical Examination (OSCE)

**Material and methods:-**The research approach and design were Qualitative Descriptive. The subjects were 30 nursing students of 1<sup>st</sup> year RGNM and 4 nursing supervisors. Subjects selected were group of individual undergone OSCE process. Data was collected using Demographic data profile, Rating scale, opinionnaire and open suggestions. Data were analyzed using descriptive and inferential statistics.

#### **Results:**

##### **Nursing Students:**

- Majority of subjects 76.66% rated OSCE as Excellent.
- Students found OSCE easy, less time consuming, substitute for routine clinical evaluation, objective and thus would like to undergo again.

##### **Nursing Supervisors:**

- 100% of them felt OSCE is timely, objective, provides appropriate feedback.75% agreed for OSCE as systematic way for conduction of practical examination whereas 25% disagreed it. 50% felt that students exhibited improved confidence level during OSCE whereas 50% disagreed.
- Also stated its benefits, weakness and points to improve.

**Conclusion:-**OSCE proved to be an excellent method of clinical evaluation and has lot of advantages as new method of clinical evaluation.

**Key words:-**Experience, Nursing students, Nursing supervisors, OSCE, Clinical teaching.

**Introduction:**

*“The first step to personal growth is the ability to make an honest assessment of where you currently are.”*

Evaluation is the systematic process of determining the extent to which the pupil achieves educational objectives. Evaluation is a continuous process of collecting, recording and interpreting information. Teaching, learning, and evaluation are interdependent. The evaluation includes selecting appropriate technical methods, its administration, and interpretation of results. The purpose of the evaluation is to improve learning. Evaluation helps the learner to know what they should learn. It also provides information about their progress and recognizes the areas of learning difficulties. Clinical evaluation is a critical element in the professional education program. It is very important to assess the student's competency in actual practice. The main purpose of the clinical evaluation is to assess quality and standards of clinical performance and to give them feedback to facilitate achievement of objectives. Evaluation is always based on objectives. The method used for evaluation should be flexible, reliable, valid, feasible and acceptable to clinical instructors and students.

**Purposes of OSCE:**

1. To provide objective based feedback.
2. To enhance ongoing learning.
3. To determine Strengths and Learning Needs.
4. To provide essential procedural skills along with right knowledge and attitude.
5. To facilitate self-assessment.
6. To deliver High-Quality objective based feedback.
7. To bridge the gap between routine evaluation technique and OSCE Programme.
8. To build up motivation & self-esteem among nursing students.
9. To improve the student's performance to a specific grade.
10. To gain the confidence of student's in the clinical area.

**Methodology:**

The research approach and design were Qualitative Descriptive. The subjects were 30 nursing students of 1<sup>st</sup> year RGNM and 4 nursing supervisors. Subjects selected were group of individual undergone OSCE process. Data was collected using Demographic data profile, Rating scale, opinionnaire and open suggestions. Data were analyzed using descriptive and inferential statistics.

**Tool**

1. Demographic profile
  - a. Nursing Student
  - b. Nursing Supervisor
2. Experience of Nursing student –
  - a. Rating Routine clinical Evaluation and OSCE
  - b. Personal Experience of Student
3. Experience of Nursing Supervisor
  - a. Opinionnaire about OSCE
  - b. Suggestions by Supervisors

**Variables under study:**

**Dependent variables:** experience of nursing supervisors and students

**Independent variables:** OSCE.

**Demographic variables:** - Demographic variables under the study were age, Sex, Previous knowledge about OSCE, previous exposure to OSCE

**Settings of the study**

The investigator conducted the study in MCH laboratory of selected nursing college. Post OSCE nursing student's and supervisor's experience assessed

**Population:** 1<sup>st</sup> year RGNM nursing students and nursing supervisors conducting OSCE.

**Sample:** Sample consisted of 1<sup>st</sup> year RGNM nursing students and nursing supervisors conducting OSCE of the selected nursing colleges of Mumbai city.

**Sample size:** Pilot study was conducted on 5 students of 3<sup>rd</sup> Basic B.Sc. nursing plus 4 nursing supervisors whereas the Main study was performed on 30 students of 1<sup>st</sup> year RGNM nursing students and nursing supervisors conducting OSCE.

**Sampling criteria:-** Purposive convenient sampling technique.

**Inclusion criteria:**

1. Subjects who are willing to participate in the study
2. Students of 1<sup>st</sup> year RGNM and supervisors undergoing OSCE.
3. Subjects present on the day of the main study.

**Exclusion criteria:**

1. Subjects who are not willing to participate in the study
2. Students and supervisors other than of 1<sup>st</sup> year RGNM undergoing OSCE.
3. Subjects absent on the day of the main study.

**Limitations:** - Study is limited to:

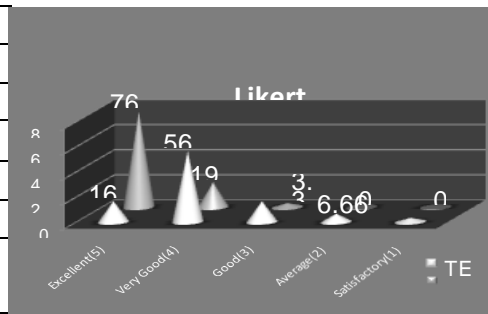
1. of 1<sup>st</sup> year RGNM nursing students and nursing supervisors conducting OSCE only
2. A sample size of 30 students plus 4 supervisors.
3. Structured checklist-based evaluation and feedback only.

**Ethical considerations:**

Ethical approval was sought from Principal and class coordinators of the respective class. The researcher also obtained permission from a sister in charge to relieve subjects during data collection. Permission from MCH lab in charge also secured. Written informed consent was obtained from each participant. The researcher assured the participants of confidentiality and anonymity and no name or any form of identity was indicated on the tool.

**Results:****A) Nursing Student****A1: Routine clinical evaluation versus OSCE**

S N	Rating score	TE		OSCE	
		Frequency	(%)	Frequency	(%)
1	Excellent (5)	5	16.66	16.66	76.66
2	Very good (4)	17	56.66	56.66	19.98
3	Good (3)	5	16.66	16.66	3.33
4	Average (2)	2	6.66	6.66	0
5	Satisfactory (1)	1	3.33	3.33	0



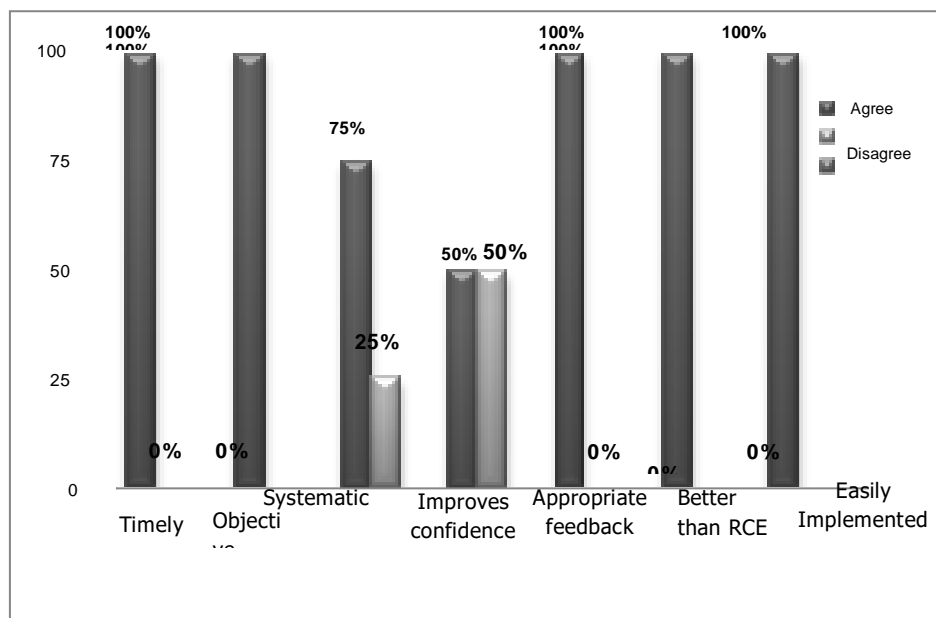
16.66% (5), 56.66% (17), 16.66% (5), 6.66% (2) and 3.33% (1) scored excellent, very good, good, average and satisfactory respectively for RCE. Whereas 76.66% (23), 19.98% (6) and 3.33% (1) scored excellent, very good, good respectively for OSCE. None of them scored average or satisfactory for OSCE.

**A2: Personal experience of the Students:**

- Students found it easy to perform the procedure in sequential order.
- Students felt OSCE is less time consuming
- Students liked and suggested to implement OSCE as a substitute for routine clinical evaluation.
- There was no bias.
- Students want to undergo OSCE again.

**B) Nursing Supervisors:****B1: Distribution of frequency and percentage according to supervisor perception**

S. No	Opinionnaire	Agree		Disagree	
		f	%	f	%
1	Complete task in a given period of time	4	100%	0	0%
2	OSCE ensures objectivity in evaluation	4	100%	0	0%
3	OSCE is a systematic way to conduct practical examination	3	75%	1	25%
4	Student exhibits improvement in confident level during OSCE	2	50%	2	50%
5	OSCE provides appropriate feedback to students after each evaluation	4	100%	0	0%
6	OSCE is better than routine clinical evaluation	4	100%	0	0%
7	OSCE can be very well implemented on every procedure.	4	100%	0	0%



### Distribution of frequency according to supervisor perception

According to supervisors perception- 100%(4) of them felt OSCE helped in timely completion of task, ensured objectivity in evaluation, appropriate feedback provided better than routine clinical evaluation and can be implemented on every procedure.75%(3) agreed for OSCE as systematic way for conduction of practical examination and 25%(1) disagreed it.50%(2) felt that students exhibited improved confidence level during OSCE and 50%(2) disagreed with this statement.

### B2: Distribution of samples according to Suggestions given by the Supervisors

#### B2.1 Profile regarding Experience

In OSCE 75% of the population that is 3 supervisors have positive approach and experience of OSCE and 25% of the population that is 1 supervisor has negative approach. Positive feedback commonly included objectivity, novelty, interesting, scoring, reducing fear and

boosting confidence level whereas negative feedback included its limitations, non-acceptance by college or university, time consuming and planning. In routine clinical examination 25 % of the populations have positive approach towards routine clinical examination however 75% of the population that is 3 supervisors have negative approach toward routine clinical examination. Positive feedback mainly included familiarity, routine way, possible adjustments, same manner in which final university examination will be taken whereas negative feedback included exhausting, fearful viva as well procedures, lack of objectivity, no any innovation and difficulty in scoring good marks.

### **B2.2 Profile regarding Strengths and weakness of OSCE and RCE**

In OSCE 75% of the population that is 3 supervisors mentioned strengths of OSCE as they have felt that it is feasible, specific and easy to conduct whereas 25% of the population that is 1 supervisor mentioned its weakness, in OSCE as they felt that its time consuming, different than routine and non-familiar. In Routine Clinical Examination (RCE), 25 % of the population that is 1 supervisor mentioned strengths of Routine Clinical Examination (RCE) because they felt that traditional methods of examination are feasible however 75% of the population that is 3 supervisors mentioned its weakness.

### **B2.3 Profile regarding Steps to improve**

Steps to improve Objective Structured Clinical Examination (OSCE) mainly included training program for colleges, availing require resources, introduction of Objective Structured Clinical Examination (OSCE) to students, more planning, including for all subjects, time management whereas steps to improve Routine Clinical Examination (RCE) included more objectivity, flexibility, student friendly, avoid lengthy exams and viva. Some of the supervisors i.e. 50% (2) also stated that neither one method is good or bad. It requires careful merging of both methods i.e. Objective Structured Clinical Examination (OSCE) and Routine Clinical Examination (RCE).

### **Conclusion**

OSCE proved to be an excellent method of clinical evaluation and has lot of advantages as new method of clinical evaluation.

### **Recommendations**

1. The study can be replicated on a larger sample for generalization of the findings.
2. A comparative study can be conducted on TE technique and OSCE method.

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## Establishment of in-vitro-in-vivo relationship for immediate release tablet dosage form of linagliptin and metformin hydrochloride

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**Abstract:**-The present work was associated to establishment of in-vitro-in-vivo relationship by using different in-vitro-in-vivo model for immediate release tablet dosage form of linagliptin and metformin hydrochloride. For in-vitro-in-vivo creation of the articulated tablet dosage form, the Weibull model and Makoid Banakar model were selected for linagliptin and metformin HCl, correspondingly to study dissolution outline. The Numerical Deconvolution model was nominated for in-vivo study for together formulated drugs. The mean plasma concentration time profile (graph) of linagliptin and metformin HCl after single oral dose of linagliptin and metformin HCl (2.5 mg/1000 mg) under fasted state was referred. The digitized data was extracted from published graphs by WebPlotDigitizer software to get mean plasma concentration time profile of the respective drugs (linagliptin and metformin HCl). Linear correlation model for linagliptin and metformin HCl ( $Fab = AbsScale * Diss (Tscale * Tvivo)$ ) was recognized using IVIVC toolkit of Phoenix WinNonlin software. In conclusion, the in-vitro-in-vivo relationship was established for test (formulated dosage form) with multiple time point's dissolution data.

**Keywords:**-In-vitro-in-vivo relationship, immediate release tablet, linagliptin, metformin.

**1. Introduction:**-Major causes of death during last decade are coronary heart disease (cardiac problem), stroke, chronic pulmonary obstructive disease (COPD), diabetes mellitus and lower respirational infections. The diabetes instigated 1600000 (2.8%) deaths in 2015, up from 1000000 (1.8%) demises in 2000 [1,2].

FDC bilayer tablet of metformin hydrochloride (antidiabetic) and metoprolol tartrate (antihypertensive) were formulated to provide controlled drug delivery with extended drug release to treat diabetic dyslipidaemia along with hypertension. One layer of tablet was sustained release layer, which is composed of metformin hydrochloride, HPMC K100, Eudragit S 100, lactose, magnesium stearate and starch mucilage. Similarly, another layer was immediate release layer of metoprolol tartrate, which was formulated with lactose, starch, cross povidone, sodium starch glycolate and magnesium stearate [3]. Immediate-release bilayer tablet of telmisartan and hydrochlorothiazide were compressed by using starch glycolate of sodium lactose monohydrate and microcrystalline cellulose (disintegrant), paste of starch (binder), Lactose (Bulk forming agent or additive), magnesium stearate (lubricant) with double-layer compression machine. The telmisartan was used as its sodium salt to increase solubility and drug release [4]. Likewise, Dandare M S *et. al* have also used converted water soluble telmisartan sodium for the two-layered tablet as a novel method for instant release of drugs for the treatment of hypertensive patients (telmisartan and hydrochlorothiazide combination). Double layer compression machine was used for tableting by using sodium starch glycolate (super disintegrating agent), lactose monohydrate, microcrystalline cellulose (diluent), magnesium stearate (lubricant) [5]. The bilayer tablet of ziprasidone hydrochloride and trihexyphenidyl hydrochloride have been prepared by using colloidal form of silicon dioxide (SiO<sub>2</sub>) for the regular release film and both grades of hydroxypropyl methylcellulose (HPMC K4M and HPMC K15M) for the sustained release layer. Incorporation of sodium bicarbonate provides floating layer of the tablet. The

formulated FDC is designated for the management of schizophrenia and acute maniac episodes accompanying by bipolar disorders [6].

Manikandan M. *et. al* have used for formulating tablets of metformin hydrochloride and glimepiride by consuming lactose monohydrate (diluent), sodium starch glycolate (disintegrating agent), microcrystalline cellulose (binder and diluent), crospovidone (binder), magnesium stearate (lubricant) by wet granulation method. Immediate release layer of glimepiride prepared using super disintegrate and starch glycolate of sodium, Kyron T-314 (novel super disintegrating agent), Avicel PH-112 (binder), magnesium stearate (lubricant) and red oxide of iron (colouring agent). Sustained release granules of highly water-soluble drug (metformin HCl) were prepared by hot melt extrusion method at temperature of 90-140°C and 20 rpm screw speed. The used excipients were Eudragit RSPO (hydrophilic polymer, sustained action), PEG 6000 (polyethylene glycol, lubricant), citric acid (pH-regulator), Avicel PH-112 (binder), magnesium stearate (lubricant) and talc (anticaking agent) [7-8]. In-vitro-in-vivo correlation (IVIVC) permits forecast of the in-vivo response or action of the drug on the basis of in-vitro drug release profiles. It is also defined by the U.S Food and Drug Administration (FDA) as “a predictive mathematical model describing the relationship between the in-vitro property of an oral dosage form and relevant in vivo response” [9]. Thus, present research work was aimed to establish in-vitro-in-vivo relationship (IVIVR) by using different IVIVR model.

**2. Experimental:-**The *In-vitro-in-vivo* relationship (IVIVR) was established for fasted condition as food effect were not reported in literature and following steps were followed to develop IVIVR model:

1. Selection of the dissolution parameters
2. Development of IVIVR model by using IVIVC Toolkit of Phoenix Win Nonlin Software
3. Generation of UIR (Unit impulse response) data with IR formulation of linagliptin/metformin hydrochloride immediate-release tablets
4. Establishment of *in vitro-in vivo* relationship (IVIVR) with Pilot BE/Pivotal study by using plasma concentration data with time (available in literature)
5. Selection and correlation of model
  - a. *In-vitro* dissolution facts were examined by means of different models (Hill, Weibull, double Weibull and Makoid-Banakar models).
  - b. The greatest perfect was estimated on the basis of pragmatic and forecast value, coefficient of variation ( $R^2$ ) of the assessed parameters for all replicas, Akaike information criterion (AIC) and Schwarz's Bayesian criterion (SBC).
  - c. Correlation model was evaluated on the basis of AIC, SBC,  $R^2$ , observed and predicted value, along with prediction error (% PE) limit .
6. Reference model and test model were developed on the basis of above criteria with multiple time as well as selective dissolution time points.

**3. Result & Discussion:-***In-vitro-in-vivo* relationship (IVIVR) for formulated immediate-release tablet of linagliptin and metformin hydrochloride was established in reference to its brand product JENTADUETO® (2.5 mg + 1000 mg). The recommended parameters and dissolution of formulated tablets (2.5 + 500 mg, 2.5 + 850 mg and 2.5 + 1000 mg) were performed in OGD recommended media. As per “Guidance for industry oral dosage forms: Development, evaluation, and application of *in-vitro/in-vivo* correlations”, IVIVCs are usually developed in the fasted state. Hence, IVIVR was established for fasted condition as food effect were not reported in literature.

**3.1. Reference IVIVR establishment:-**In order of reference IVIVR establishment, the dissolution profile of reference drug product (Jentadueto Tablet) was established by using 0.1

N hydrochloric acid (900 mL, dissolution media) in dissolution apparatus type II (Paddle) at 50 RPM. The data were observed at multiple times.

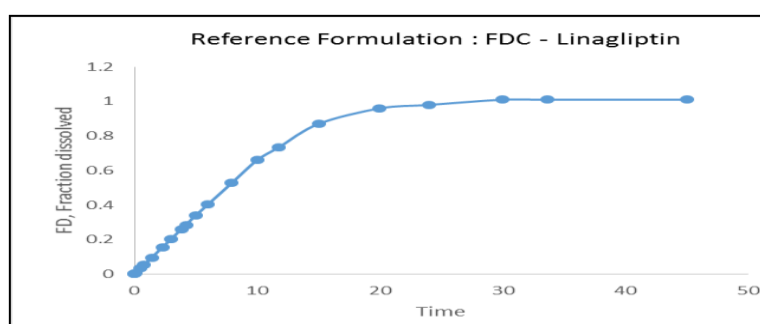
**3.2. Selection of model for Linagliptin:-**From the linagliptin dissolution data of reference formulation (Jentaducto Tablet, Fig.1), the Akaike information criterion (AIC), Schwarz's Bayesian criterion (SBC) and coefficient of variation ( $R^2$ ) were calculated for different *in-vitro* models viz. Hill-type, Weibull distribution, Double Weibull and MakoidBanakar (Table 1). Software named as Phoenix WinNonlin (8.1) was used to calculate above these parameters. Double Weibull model was failed to fit for the dissolution data of the drug, while other three models (Hill-type, Weibull distribution and MakoidBanakar) were found to be fit model for linagliptin dissolution data. Weibull model was finalized on the basis of low AIC (-55.873), low SBC (-56.035) with best coefficient of variation ( $R^2 = 0.999$ ) compared to the other dissolution model and good fit of observed dissolution data with predicted data.

**Table 1 Statistical analysis of linagliptin dissolution data for different in-vitro models**

<i>In-vitro</i> model	AIC value	SBC value	$R^2$ value	Remark
Hill model	-36.744	-36.906	0.998	Fit model
<b>Weibull model</b>	<b>-55.873</b>	<b>-56.035</b>	<b>0.999</b>	<b>Best fit model</b>
Double Weibull model	-	-	-	Failed to fit model
MakoidBanakar model	-52.406	-52.568	0.999	Fit model

$R^2$  = coefficient of variation; AIC = Akaike information criterion;

SBC = Schwarz's Bayesian criterion



**Fig. 1 Dissolution profile of linagliptin in reference formulation (Jentaducto Tablet).**

**3.3. Selection of model for Metformin HCl:-**As similar fashion of linagliptin, from the metformin HCl dissolution data of reference formulation (Jentaducto), the Akaike information criterion (AIC), Schwarz's Bayesian criterion (SBC) and coefficient of variation ( $R^2$ ) were calculated for different *in-vitro* models viz. Hill-type, Weibull distribution, Double Weibull and MakoidBanakar (Table 2). These values for the different models were calculated by software named as Phoenix WinNonlin (8.1). As like linagliptin, Double Weibull model was failed to fit for the dissolution data of the drug, while other three models (Hill-type, Weibull distribution and MakoidBanakar) were found to be fit model for metformin HCl dissolution data.

Table 2 Statistical analysis of metformin HCl dissolution data for different *in-vitro* models

<i>In-vitro</i> model	AIC value	SBC value	R <sup>2</sup> value	Remark
Hill model	-35.8887	-36.0509	0.998	Fit model
Weibull model	-51.8007	-51.963	0.999	Fit model
Double Weibull model	-	-	-	Failed to fit model
<b>MakoidBanakar model</b>	<b>-53.833</b>	<b>-53.996</b>	<b>0.999</b>	<b>Best fit model</b>

R2 = coefficient of variation; AIC = Akaike information criterion; SBC = Schwarz’s Bayesian criterion

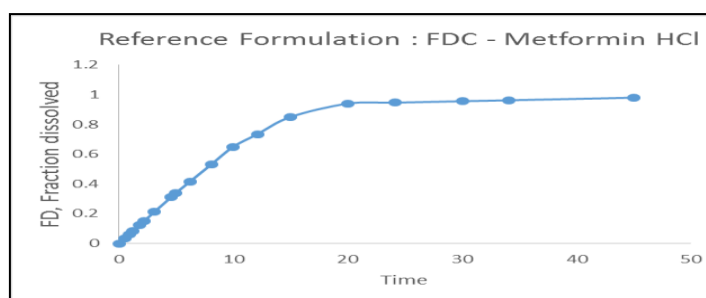
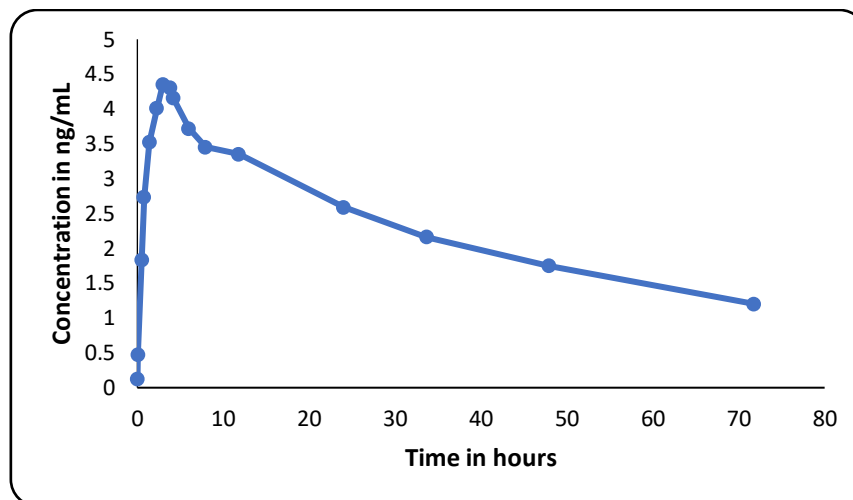


Fig. 2 Dissolution profile of metformin HCl in reference formulation (Jentadueto Tablet)

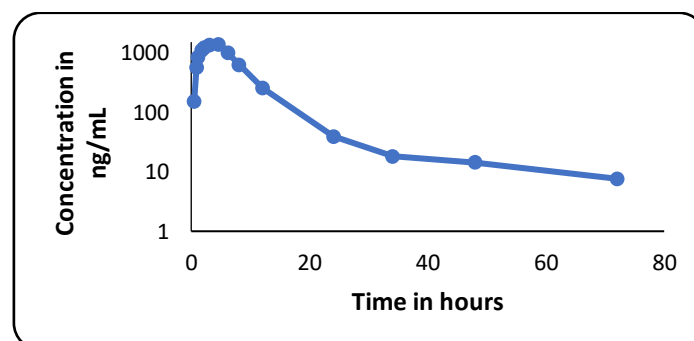
Makoidbanakar model was finalized on the basis of low AIC (-53.833), low SBC (-53.996) with best coefficient of variation value (R<sup>2</sup> = 0.999) compared to the other dissolution model and good fit of observed dissolution data with predicted data. Thus, for IVIVR establishment of the formulated product, the Weibull model and MakoidBanakar model were selected for linagliptin and metformin HCl, respectively to study dissolution profile. The Numerical Deconvolution model was selected for *in-vivo* study for both drugs (Table 3). **Table 3 Dissolution profile parameters of drugs for IVIVR establishment**

Parameter	Linagliptin	Metformin HCl
Media	0.1 N HCl	0.1 N HCl
Dissolution volume	900 mL	900 mL
Apparatus & RPM	Paddle, 50 rpm	Paddle, 50 rpm
Dissolution time points	Multiple time points	Multiple time points
Dissolution model	<b>Weibull</b>	<b>MakoidBanakar</b>
<i>In-vivo</i> model	Numerical Deconvolution	Numerical Deconvolution

**3.4. Mean plasma concentration time profile:** -The mean plasma concentration time profile (graph) of linagliptin and metformin HCl after single oral dose of linagliptin and metformin HCl (2.5 mg/1000 mg) under fasted state was referred from already published data [129]. The digitized data was extracted from published graphs (Fig. 3 and Fig.4) by WebPlotDigitizer software to get mean plasma concentration time profile of the respective drugs (linagliptin and metformin HCl) (Table 4).



**Fig. 3** Mean plasma concentration time profile of linagliptin after single oral dose of linagliptin and metformin HCl (2.5 mg/1000 mg) under fasted state



**Fig. 4** Mean plasma concentration time profile of metformin HCl after single oral dose of linagliptin and metformin HCl (2.5 mg/1000 mg) under fasted state

**Table 4** Mean plasma concentration time profile of linagliptin and metformin HCl after single oral dose of linagliptin and metformin HCl (2.5 mg/1000 mg) under fasted state (digitized data from graph)

Linagliptin		Metformin HCl	
Time (hr)	Mean plasma conc. (ng/mL)	Time (hr)	Mean plasma conc. (ng/mL)
0.017	0.12	0.50	150.40
0.08	0.47	0.90	558.30
0.52	1.83	1.20	842.60

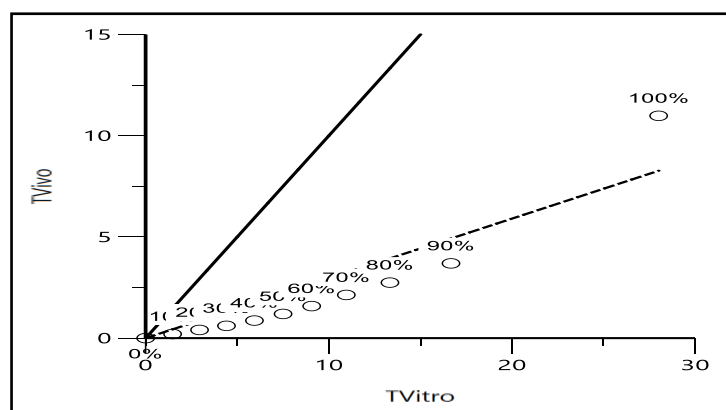
0.78	2.73	1.80	1102.30
1.40	3.52	2.20	1219.20
2.26	4.01	3.10	1326.00
2.99	4.35	4.60	1382.80
3.83	4.30	6.20	980.00
4.19	4.16	8.10	622.70
6.00	3.72	12.10	251.40
7.93	3.45	24.10	39.00
11.80	3.35	34.10	18.20
24.01	2.59	48.00	14.30
33.68	2.16	72.10	7.60
47.94	1.75	-	-
71.76	1.20	-	-

### 3.5.Linear correlation models for linagliptin

IVIVR model was established using IVIVC toolkit of Phoenix WinNonlin (Correlation Model:  $Fab = AbsScale * Diss (Tscale * Tvivo)$ ) evaluated for the study. A reasonably better relationship was found in between the portions of *in-vivo* and *in-vitro* drug issue or release with better value of correlation coefficient ( $R^2 = 0.991$ ) for reference formulation and its predicted values (Table 5& Fig. 5). Thus, it was concluded that good correlation between observed and predicted value, suggesting the better model fitting as % PE of -0.002 and 4.619 for AUC<sub>0-t</sub> and C<sub>max</sub> respectively, which satisfies the FDA requirement of individual % PE (below 15%) (Table 6).

**Table 5 Summary of linear correlation models for linagliptin by toolkit of Phoenix WinNonlin**

Correlation model	AIC	SBC	R <sup>2</sup>	Remark
Fab = Diss (Tvivo)	147.546	152.776	0.733	Poor value R <sup>2</sup>
<b>Fab = Abs scale*Diss (Tscale* Tvivo)</b>	<b>-343.395</b>	<b>- 38.165</b>	<b>0.991</b>	<b>Best model fit</b>
Fab = Abs scale*Diss (Tscale* Tvivo-Tshift)	341.388	-333.543	0.991	Good model fit
Fab = Abs scale*(Diss (Tscale* Tvivo-Tshift))-AbsBase)	-	-	-	Unable to complete



**Fig. 5** Correlation overlay and levy plot for linagliptin (○ ○ ○ ○ ○ levy point reference; — Unity line; ----- Regression)

**Table 6** Pharmacokinetic parameters of linagliptin for *in-vitro in-vivo* correlation

Values	Pharmacokinetic Parameters	
	AUC0-t	Cmax
Predicted	163.949	4.551
Observed	163.952	4.350
%PE	-0.002	4.619
Pred/Obs Ratio	1.000	1.046

(AUC0-t = Area under plasma concentration-time curve from time zero to time last quantifiable time; Cmax = maximum (or peak) serum concentration; % PE = % prediction error; Pred/Obs Ratio = Ratio of predicted value to observed value)

### 3.6. Linear correlation models for metformin HCl

IVIVR model was established using IVIVC toolkit of Phoenix WinNonlin [Correlation Model:  $Fab = AbsScale * Diss (Tscale * Tvivo)$ ] was evaluated for the study. In similar fashion of linagliptin, practically better relationship was found in between the segments of *in-vivo* and *in-vitro* pattern of drug issue or release with better correlation coefficient value ( $R^2 = 0.899$ ) for reference formulation (Fig. 6 and Table 7). Thus, it was concluded that good correlation between observed and predicted value, suggesting the better model fitting as % PE of -0.593 and -2.278 for AUC0-t and Cmax respectively, which satisfies the FDA requirement of individual %PE (below 15%) (Table 8).

**Table 7** Summary of linear correlation models for metformin HCl by toolkit of Phoenix WinNonlin

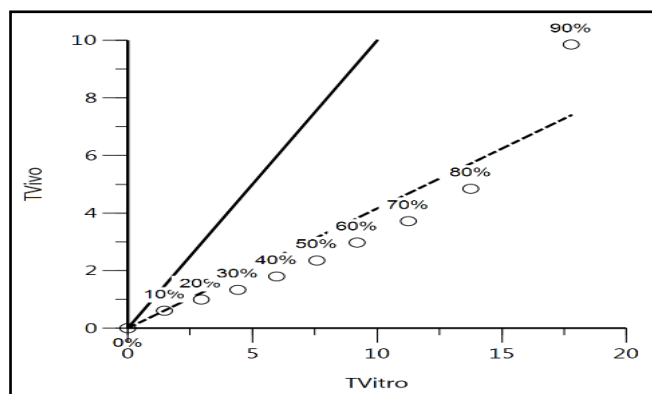
Correlation model	AIC	SBC	$R^2$	Remark
Fab = Diss (Tvivo)	78.568	83.798	0.886	Fit model
<b>Fab = Abs scale*Diss</b>	<b>-206.251</b>	<b>-201.021</b>	<b>0.977</b>	<b>Best Fit model</b>



**(Tscale\* Tvivo)**

Fab = Abs scale\*Diss (Tscale\* Tvivo-Tshift) -204.279 -196.434 0.977 Fit model

Fab = Abs scale\*(Diss (Tscale\* Tvivo-Tshift))-AbsBase) -202.239 -191.779 0.977 Fit model



**Fig. 6**Correlation overlay and levy plot for metformin HCl (○○○○○ levy point reference; — Unity line; ----- Regression)

**Table 8** Pharmacokinetic parameters of metformin HCl for *in-vitro in-vivo* correlation

Values	Pharmacokinetic Parameters	
	AUC0-t	Cmax
Predicted	12220.45	1351.287
Observed	12293.36	1382.8
%PE	-0.593	-2.278
Pred/Obs Ratio	0.9940	0.9772

(AUC0-t = Area under plasma concentration-time curve from time zero to time last quantifiable time; Cmax = maximum (or peak) serum concentration; % PE = % prediction error; Pred/Obs Ratio = Ratio of predicted value to observed value)

**3.7.Test IVIVR establishment:-**IVIVR was established for test (formulated dosage form) with multiple time point's dissolution data (Media: 0.1N HCl /900 ml/USP II paddle/50 RPM)(Table 9). The dissolution profile of linagliptin and metformin HCl from formulated drug product was established. The dissolution profile was used to calculate the AUC0-t and Cmax of the both drugs (linagliptin and metformin HCl). The ratio of target value (T) to predicted value (P) for these parameters (AUC0-t and Cmax) for the both drugs were within limits (Table 10).

**Table 9** Dissolution profile of linagliptin and metformin HCl from formulated drug product (2.5/1000 mg)

Time (Min)	Linagliptin		Metformin HCl	
	Mean	% RSD	Mean	% RSD
5	30	7.8	33	6.2
10	62	6.4	66	5.7
15	85	5.5	90	5.0
20	94	1.5	100	1.5
30	95	1.1	100	0.4
45	95	1.2	100	1.3
60	94	1.4	100	0.9

**Table 10** IVIVR of test formulation and its predicted values

Parameters	Test Linagliptin		Test Metformin HCl	
	AUC0-t	Cmax	AUC0-t	Cmax
Predicted value (P)	154.97	4.44	12498.92	1469.95
Target value (T)	163.95	4.35	12293.36	1382.80
% PE	-5.48	2.08	1.67	6.30
Ratio	0.93	0.94	1.02	1.06
P/T*100	94.5	97.6	102.3	108.8

% PE = % prediction error

In order of reference IVIVR establishment, the dissolution profile of reference drug product (Jentaduetto Tablet) was established by using 0.1 N hydrochloric acid (900 mL, dissolution media) in dissolution apparatus type II (Paddle) at 50 RPM (Table 11).

**Table 11** Summary of *in-vitro in-vivo* correlation study for formulated immediate release tablet

Parameter	Linagliptin	Metformin HCl
BCS Class	Class III	Class III
pKa value	8.6 & 1.9	12.4
Dissolution model (Best)	Weibull model	MakoidBanakar model

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*In-vivo* model

Numerical Deconvolution

Numerical Deconvolution

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**4. Conclusion :-**For IVIVR creation of the formulated drug product, the Weibull model and MakoidBanakar model were designated for linagliptin and metformin HCl, correspondingly to study dissolution outline. The mean plasma concentration time profile (graph) of linagliptin and metformin HCl after single oral dose of linagliptin and metformin HCl (2.5 mg/1000 mg) under fasted state was referred. The digitized data was extracted from published graphs by WebPlotDigitizer software to get mean plasma concentration time profile of the respective drugs (linagliptin and metformin HCl). Linear correlation model for linagliptin and metformin HCl ( $Fab = AbsScale * Diss (Tscale * Tvivo)$ ) was established using IVIVC toolkit of Phoenix WinNonlin software. Finally, the IVIVR was established for test (formulated dosage form) with multiple time point's dissolution data.

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## **A STUDY ON PRETERM INFANTS ADMITTED IN NICU TO ASSESS THE EFFECTIVENESS OF NON NUTRITIVE SUCKING IN IMPROVEMENT OF SUCKING REFLEX.**

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**ABSTRACT:-**Feeding is an intimate time wherever there are several opportunities for interaction between a mother and babe also as for learning and developing new skills. Feeding provides a chance and framework for the development of social interaction and learning. For premature infants, the event of feeding will be a complex method because of a variety of factors regarding neurological immaturity, inconsistent physiological stability and restricted ability to demonstrate non-verbal communication. Some premature infants want different feeding ways till they acquire the abilities necessary for oral feeding and in such cases the utilization of a non-nutritive sucking (NNS) programmed can be useful. Sucking, each wholesome and non-nutritive, is significant within the early development of the kid. it's necessary for receiving nutrition, for providing stability in distress and acts as a way of exploring the surroundings. Non wholesome uptake facilitate improve respiration and oxygenation. It's Stimulate the stomach to assist digest milk more simply. Objective of this study to improve sucking reflex by non nutritive sucking method.

**KEYWORDS:** - Non nutritive sucking, sucking reflex, neonatal intensive care unit,

**INTRODUCTION:** - Non-nutritive sucking is that the method of permitting a baby to suck while not taking any milk. Ideally this can be at the breast (after milk has been expressed), however once this can be impossible, the utilization of a dummy could also be useful. Non-nutritive uptake is wherever a baby sucks while not receiving any nutrition, for instance example} on a dummy or an empty breast. Babies of all ages notice uptake soothing. From as early as eleven weeks gestation the baby in your uterus can have gained apply and knowledge of sucking. Non-nutritive ingestion encourages ingestion and weight gain

**METHOD:-**This study was conducted under quantitative approach. However Quasi experimental non-equivalent control group research design was adopted. A total twelve hundred preterm infant admitted in Neonatal intensive care unit were selected for study and randomly divided into two group each of equal size 600 by Simple random techniques. Which further statistical analyzed and treated as experimental group( $n_1 = 600$ ) and control group ( $n_2 = 600$ ) for present study.

**STATEMENT OF PROBLEM:** - "A STUDY ON PRETERM INFANTS ADMITTED IN NICU TO ASSESS THE EFFECTIVENESS OF NON NUTRITIVE SUCKING IN IMPROVEMENT OF SUCKING REFLEX AT HOSPITALS OF INDORE CITY.

**OBJECTIVES:-**

1. To assess the effect of non nutritive sucking in improvement of sucking reflex among preterm infants in experimental group.
2. To assess the effect of non nutritive sucking in improvement of sucking reflex among preterm infants in control group.
3. To compare the effect of non nutritive sucking in improvement of sucking reflex among preterm infants in experimental group and control group
4. To find out the association between non nutritive sucking in improvement of sucking reflex among preterm infants in experimental group and control group with selected demographic variable.

**HYPOTHESES:-**

**RH<sub>1</sub>** - There will be a significant difference between non nutritive sucking in improvement of

sucking reflex among preterm infants in experimental group.

**RH<sub>0</sub>**- There will be a no significant difference between non nutritive sucking in improvement of sucking reflex among preterm infants in experimental group.

**RH<sub>2</sub>** - There will be a significant difference between non nutritive sucking in improvement of sucking reflex among preterm infants in control group.

**RH<sub>0</sub>**- There will be a no significant difference between non nutritive sucking in improvement of sucking reflex among preterm infants in control group.

**RH<sub>3</sub>**– There will be a significant comparison between non nutritive sucking in improvement of sucking reflex among preterm infants in experimental group and control group.

**RH<sub>0</sub>** – There will be a no significant comparison between non nutritive sucking in improvement of sucking reflex among preterm infants in experimental group and control group.

**RH<sub>4</sub>**- There will be a significant association between non nutritive sucking in improvement of sucking reflex among preterm infants with selected demographic variables.

**RH<sub>0</sub>**- There will be a no significant association between non nutritive sucking in improvement of sucking reflex among preterm infants with selected demographic variables.

**MATERIAL AND METHOD :-** This study was conducted under quantitative approach. however Quasi experimental non-equivalent control group research design was adopted. A total twelve hundred preterm infant admitted in Neonatal intensive care unit were selected for study and randomly divided into two group each of equal size 600 by Simple random techniques. Which further statistical analyzed and treated as experimental group( $n_1 = 600$ ) and control group ( $n_2 = 600$ ) for present study.

**Target population :-** All preterm infant admitted in NICU at Indore city (M.P).

**Accessible population :-** All preterm infant admitted in NICU al selected hospital of Indore City.

**RESULT AND DISCUSSION: -** Twelve hundred preterm infant participate in the present study utilize to examine the effect of non nutritive sucking improvement of sucking reflex among preterm infant admitted in NICU.

**TABLE – 1 IDENTIFICATION MAIN FEATURES AND CHARACTERISTICS OF STUDIED PRETERM INFANT AND THEIR MOTHER**

**N= 1200**

	Frequency $n_1$	Percentage %	Frequency $n_1$	Percentage %
1. Age				
<b>28-31</b>	212	35.3	243	<b>40.5</b>
<b>31-34</b>	173	28.8	162	<b>27.0</b>
<b>34-37</b>	215	35.8	195	<b>32.5</b>
2. Gender				
<b>Male</b>	<b>298</b>	49.7	302	50.3
<b>Female</b>	<b>302</b>	50.3	298	49.7
3. Weight of preterm infant				

<b>1500-1800</b>	<b>315</b>	52.5	289	48.2
<b>1800-2100</b>	<b>151</b>	25.2	148	24.7
<b>2100-2400</b>	<b>134</b>	22.3	163	27.2
<b>4.Order of birth</b>				
<b>First</b>	311	51.8	298	49.7
<b>Second</b>	174	29.0	168	28.0
<b>Third</b>	115	19.2	134	22.3
<b>5.Age in year (Mother)</b>				
<b>18-24</b>	256	42.7	288	48.0
<b>24-30</b>	214	35.7	202	33.7
<b>30-36</b>	130	21.7	110	18.3
<b>6. Educational Qualification</b>				
<b>Illiterate</b>	107	17.8	117	19.5
<b>Primary/Middle</b>	232	38.7	208	34.7
<b>Secondary &amp; Higher Secondary</b>	189	31.5	192	32.0
<b>Graduate and above</b>	72	12.0	83	13.8
<b>7. Occupational Status</b>				
<b>Government job</b>	107	17.8	112	18.7
<b>Private job</b>	180	30.0	141	23.5
<b>House wife</b>	313	52.2	347	57.8
<b>8. Area of residence</b>				
<b>Rural</b>	238	39.7	259	43.2
<b>Urban</b>	362	60.3	341	56.8

**TABLE – 2 COMPARISON OF TOTAL SCORING OF ASSESSMENT OF SUCKING REFLEX AND NON-NUTRITIVE SUCKING PRETERM INFANT BETWEEN PRE**

**AND POST ADMINISTRATION**

Total Scoring	Sampling Stage	Scatter	Mean Diff	Z-statistic	p-value	
		Mean ± SD			(LOS)	
Experimental group	Sucking Reflex	Baseline	3.16±1.03	2.65 points	48.09	p<0.001 #
		Post	5.81±0.74			
	Non-Nutritive Sucking	Baseline	6.65±1.62	4.62 points	45.82	p<0.001 #
		Post	11.27±1.85			
	Sucking Reflex	Baseline	3.26±1.06	0.07 points	1.67	p>0.05 ⊗
		Post	3.33±0.67			
Control group	Non-Nutritive Sucking	Baseline	6.81±1.73	0.07 points	1.71	p>0.05 ⊗
		Post	6.88±1.75			

Moreover, the statistical agreement projected that the preterm infant of experimental group intervened with reliable non-nutritive sucking had better and more improved sucking reflex and non-nutritive sucking in order to examine the improvements of sucking reflex than preterm infant of control group intervened with routine care (placebo). Henceforth, statistical agreement demonstrated that the non-nutritive sucking preterm infant preferred as an effective conservative program for improving the sucking reflex. Furthermore, this was concluded that there was a significant effect of non-nutritive sucking in improvement of sucking reflex among preterm infant of experimental group.

**TABLE – 3 Measurement of Change of Sucking Reflex and Non-nutritive Sucking of Preterm infant between Groups at Pre Administration**

Parameter	Group	Scatter at Baseline	Mean Diff	Z-statistic	p-value
at Baseline Stage	(at Baseline)	Mean ± SD			(LOS)
Sucking Reflex	Experimental	3.16±1.03	0.10 points	1.69	p>0.05 ⊗
	Control	3.26±1.06			
Non-Nutritive Sucking	Experimental	6.65±1.62	0.16 points	1.66	p>0.05 ⊗
	Control	6.81±1.73			

Comparison between groups showed that the sucking reflex and non-nutritive sucking assessment among preterm infant of experimental group at day one (baseline) were judged with little differences but couldn't be confirmed as statistically significant as compared to

preterm infant of control group. However, this clearly showed table no.3 Henceforth, this is inference statistically that the preterm infant of experimental group admitted to neonatal intensive care unit along with their mother had approximately similar selected parametric values before administration as compared to preterm infant of control group at day one (baseline stage).

**TABLE 4. MEASUREMENT OF CHANGE OF SUCKING REFLEX AND NON-NUTRITIVE SUCKING OF PRETERM INFANT BETWEEN GROUPS AT POST ADMINISTRATION**

Parameter at Post Stage	Group (at Post)	Scatter at Post Mean ± SD	Mean Diff	Z-statistic	p-value (LOS)
Sucking Reflex	Experimental	5.81±0.74	2.48 points	60.62	p<0.001 #
	Control	3.33±0.67			
Non-Nutritive Sucking	Experimental	11.27±1.85	4.39 points	42.27	p<0.001 #
	Control	6.88±1.75			

Moreover, statistical agreement indicated that the preterm infant intervened with non-nutritive sucking had significantly improved sucking reflexes at fifth day than preterm infant of control group intervened with normal routine care (placebo). Henceforth, non-nutritive sucking found to be effective remedy impacted the improvements of sucking reflexes among preterm infant admitted in neonatal intensive care unit with their mother may be preferred as an effective conservative program for improving sucking reflexes.

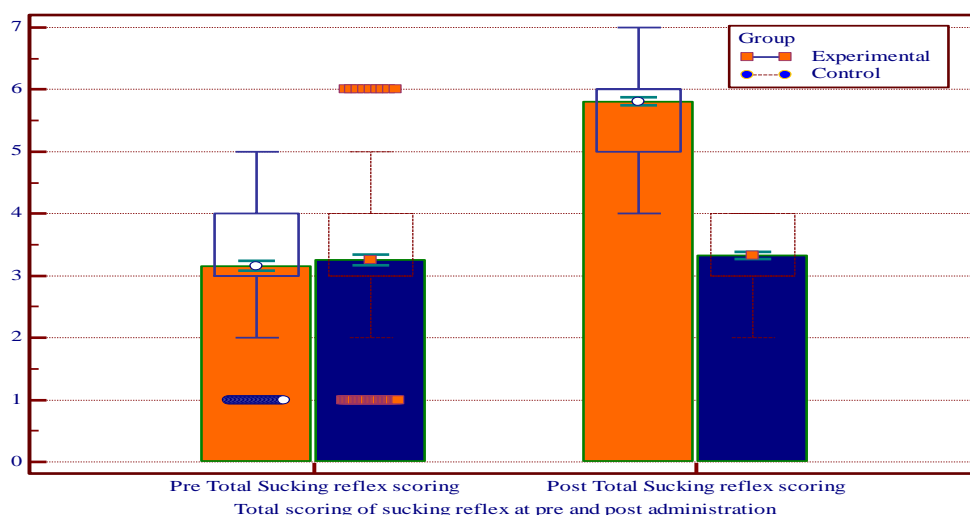


Figure I-Bar cum-Box and Whisker diagram depicting the comparison of assessment of sucking reflex at pre and post intervention between experimental group and control group.

Figure XIII showing the distribution and comparison of score assessment of sucking reflex between experimental group and control group at pre and post intervention using mean, median, quartiles and error bars (95% confidence interval of mean)



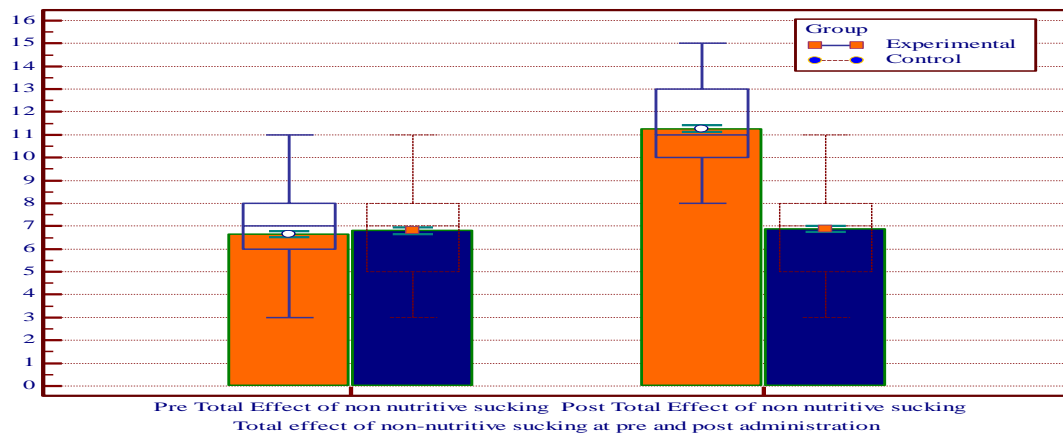


Figure XIV-Bar cum-Box and Whisker diagram depicting the comparison of non-nutritive sucking at pre and post intervention between experimental group and control group.

Figure - II reveals the distribution and comparison of non-nutritive sucking of preterm infant between experimental group and control group at pre and post intervention using mean, median, quartiles and error bars (95% confidence interval of mean)

**Table -5 THE ASSESSMENT OF SUCKING REFLEX AMONG PRETERM INFANT BETWEEN GROUPS AT POST ADMINISTRATION**

Assessment of sucking reflex at Baseline (Day one)		Experimental		Control	
		n <sub>1</sub> =600	%	n <sub>2</sub> =600	%
<b>Sucking Reflex</b>	Absent	274	45.7	226	37.7
	Present	326	54.3	374	62.3
<b>Oral Muscle Tone</b>	Absent	317	52.8	330	55.0
	Present	283	47.2	270	45.0
<b>Alert Behavior</b>	Baby is not alert	265	44.2	353	58.8
	Baby is alert	335	55.8	247	41.2
<b>Physiological Stability</b>	Physiological not stable	336	56.0	272	45.3
	Physiological stable	264	44.0	328	54.7
<b>Breast Feeding</b>	Not initiated	328	54.7	410	68.3
	Initiated	272	45.3	190	31.7
<b>Stimulation of Oral Cavity</b>	Not done	433	72.2	306	51.0
	Done	167	27.8	294	49.0
<b>Hunger Cry</b>	Yes	366	61.0	324	54.0
	No	234	39.0	276	46.0

Table 6:- Distribution And Comparison Of Total Scoring Of Sucking Reflex Of Preterm

### Infant At Pre (Baseline) And Post Administration In Groups

Assessment of Sucking Reflex (Total Scoring and Category)		Experimental group		Control group	
		n <sub>1</sub> =600	%	n <sub>2</sub> =600	%
Baseline	0-3 Poor	147	24.5	110	18.3
	4-5 Average	453	75.5	481	80.2
	6-7 Good	0	0.0	9	1.5
Post Administration	0-3 Poor	0	0.0	69	11.5
	4-5 Average	187	31.2	531	88.5
	6-7 Good	413	68.8	0	0.0

Overall, results of research indicated that the non-nutritive sucking was effective in improving the sucking reflex among preterm infant of experimental group and further showed that there was a significant difference in sucking reflex of preterm infant of experimental group than control group.

**Table 7:- Distribution And Comparison Of Effect Of Non-Nutritive Sucking On Preterm Infant And Their Mothers At Pre (Baseline) In Groups**

Non-nutritive sucking at Baseline (Scoring with Category)		Experimental group		Control group	
		Frequency	%	Frequency	%
0-5	Poor	117	19.5	195	32.5
6-10	Average	464	77.3	396	66.0
11-15	Good	19	3.2	9	1.5
Total		600	100.0	600	100.0

**Table 8:- Distribution And Comparison Of Effect Of Non Nutritive Sucking On Preterm Infant And Their Mothers At Post Administration In Groups**

Non-nutritive sucking at Post Administration (Scoring with Category)		Experimental group		Control group	
		Frequency	%	Frequency	%

0-5	Poor	0	0.0	154	25.7
6-10	Average	242	40.3	438	73.0
11-15	Good	358	59.7	8	1.3
<b>Total</b>		<b>600</b>	<b>100.0</b>	<b>600</b>	<b>100.0</b>

**Table 9:- Assessment of Improvement of Studied Parameters between Pre and Post Administration Stages in Two Groups**

Studied Parameters of Preterm infant	Mean Pre Score	Mean Post Score	Improvement (%)
<b>Experimental group</b>			
Assessment of sucking reflex	3.16	5.81	<b>83.9%</b>
Effect of non-nutritive sucking on preterm infant and mother	6.65	11.27	<b>69.5%</b>
<b>Total</b>	<b>9.81</b>	<b>17.08</b>	<b>74.1%</b>
<b>Control group</b>			
Assessment of sucking reflex	3.26	3.33	<b>2.1%</b>
Effect of non-nutritive sucking on preterm infant and mother	6.81	6.88	<b>1.0%</b>
<b>Total</b>	<b>10.07</b>	<b>10.21</b>	<b>1.4%</b>

Furthermore, non-nutritive sucking found to be effective tool noticed in improving the sucking reflex among preterm infant and further may be consider as an effective tool when there is a need in lacking, bridging and modifying the information about improvement of sucking reflexes.

**Result shows** that in the association of non nutritive sucking improvement of sucking reflex among preterm infant at pre test of experimental and control group found to statistically insignificant whereas but after administration found to be statistically significant, there was Significant ( $\chi^2 = 9.81^{\#}$ ;  $p < 0.007$ ) association between non nutritive sucking improvement of sucking reflex among preterm infant in experimental group with their practices at post-administration stage and There was an insignificant ( $\chi^2 = 3.99^{\otimes}$ ;  $p > 0.05$ ) association between non nutritive sucking improvement of sucking reflex among preterm infant admitted in NICU in control group with their practices post-administration stage.

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## Effectiveness of structured teaching programme on knowledge and attitude regarding teenage pregnancy among adolescent girls in a selected high school of rural and urban area, Bangalore.

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**ABSTRACT:-**Adolescents are an important resource of any country. On this way they may face troubles due to lack of right kind of information regarding their own physical and or sexual development. The need of career enhancement forces adolescents and youth to marry late specially those living in urban areas. Consequently, the period between the onset of puberty and marriage has increased predisposing them to risky sexual adventures. On the other hand, among illiterates the age at marriage is quite low particularly in rural areas and urban slums. Thus, girls in these communities fall into fertility trap quite early during adolescence. A pre-experimental and evaluative research approach was used with two group pre-test post-test design to evaluate the effectiveness of the STP. The study was conducted in rural and urban high school at Bangalore. Convenience sampling technique was used to select the samples. The tool used for the data collection was structured questionnaire schedule and attitude scale. Data gathered was analyzed using descriptive and inferential statistics. The major findings revealed that structured teaching programme enhanced the knowledge and change the attitude regarding teenage pregnancy. The over all mean percentage of post-test knowledge scores of the rural and urban adolescent girls 83.0% and 87.3% respectively. Indicating that the STP was effective ingaining knowledge and change in attitude of the adolescent girls regarding teenage pregnancy.

**Key Words:-** Adolescent girls, Rural, Teenage pregnancy and Urban

**INTRODUCTION:-**Child marriages are still prevalent in India the outcome of which is an increase in teenage pregnancies. The rate of early marriage is more in rural area compare to urbannized area. Early marriage pushes girl into early child bearing. It has consequences in terms of their development, fertility rate and reproductive health. Risks include hemorrhage, anemia, delayed or obstructed labor, low birth weight of the baby, miscarriage, damage to the reproductive system and in some cases, even death of the mother and infant. Also, various cases of rape on minors and other factors like lack of adequate sex education in teenagers have resulted in teen pregnancies. Teenage pregnancies are a matter of concern for both the child as well as the mother who were prone various social, emotional, economic and health problems. We need to impart sex education in schools in an organized manner. (3)During teenage period, feelings become more intense, relationships become more complex sexual behavior are radically altered. Intense exposure to sexual stimuli via mass media as made sexual activity more common among adolescents and they may lack knowledge regarding preventing pregnancy or access to conventional method preventing pregnancy, as they may be too embarrassed or frightened to seek such information. Due to this there is an increase in teenage pregnancy, abortion, STD's including AIDS among adolescent.(4)

### II Objectives:

1. To assess the knowledge and attitude of rural and urban adolescent girls regarding teenage pregnancy.
2. To compare the pre test and post test knowledge and attitude scores of urban and rural adolescent girls regarding teenage pregnancy.

3. To find the correlation between knowledge and attitude of rural and urban adolescent girls regarding teenage pregnancy.

4. To find the association between knowledge and attitude scores with selected demographic variables of rural and urban adolescent girls regarding teenage pregnancy.

**III. Materials and Methods** :-The conceptual frame work adopted for the study was based on Orem's self-care deficit theory. A comparative pre-experimental and evaluative research approach was used with two group pre-test post-test design were selected to assess the knowledge and attitude of the adolescent girls regarding teenage pregnancy. The study was conducted at Pancharukhi (Rural) high school and Universal (Urban) high school, Bangalore. The sample consist of 60 subjects from 10th standard adolescent girls were selected, 30 girls from Pancharukhi (Rural) high school and 30 girls from Universal (Urban) high school, Bangalore, Karnataka, who meets inclusion criteria for the study were selected by using convenient sampling technique, which is a non-probability sampling approach. The sample size adequacy was estimated by use of power analysis with 95% confidence level and 5% level of significance. Ethical clearance was approved by the ethical committee. Data was collected from the subjects, after the details of the study were explained to them and the written informed consent was taken from the subjects. The tool used for the data collection was structured questionnaire schedule which comprised of 11 items on demographic data, 35 items on knowledge regarding teenage pregnancy and 16 items on attitude regarding prevention of teenage pregnancy. The reliability of the tool was established by Split Half technique, with 'r' = 0.9054 for knowledge and 'r'=.0.8804 for attitude. The pre-test was administered to 30 adolescent girls in rural high school and 30 adolescent girls in urban high school, followed by STP was done. The tool used for the data collection was structured questionnaire schedule which comprised of 11 items on demographic data, 35 items on knowledge regarding teenage pregnancy and 16 items on attitude regarding prevention of teenage pregnancy. The reliability of the tool was established by Split Half technique, with 'r' = 0.9054 for knowledge and 'r'=.0.8804 for attitude. The pre-test was administered to 30 adolescent girls in rural high school and 30 adolescent girls in urban high school, followed by STP was done. Data gathered was analysed using descriptive and inferential statistics in terms of frequency, percentage, mean, standard deviation, paired't' test, student't' test and chi-square test.

**IV. RESULTS:-**Data was analysed by descriptive and inferential statistics was adopted to assess the effectiveness of structured teaching programme on knowledge and attitude of adolescent girls regarding teenage pregnancy

**TABLE: 1-Overall pretest and posttest mean knowledge scores of rural and urban adolescent girls.**

N=30

Adolescent girls	Sample (n)	Pre test			Post test			Paired 't' test
		Mean	Mean	SD	Mean	Mean (%)	SD	

			(%)					
Rural	30	17.87	51.0	11.7	29.03	83.0	8.4	22.40*
Urban	30	9.10	54.6	10.7	30.57	87.3	6.4	21.14*

\* Significant at 5% Level

t (0.05, 1df) =2.04

Table-1 indicates that among rural adolescent girls the posttest mean percent knowledge score was found higher 83% and SD value of ±8.4 when compared with pretest mean percent knowledge score value which was 51% with SD of ±11.7. Similarly, among urban adolescent girls, the posttest mean percent knowledge score was found higher 87.3% and SD of ±6.4 when compared with pretest mean knowledge score value which was 54.6% with SD of ±10.7. This is depicted in fig.1

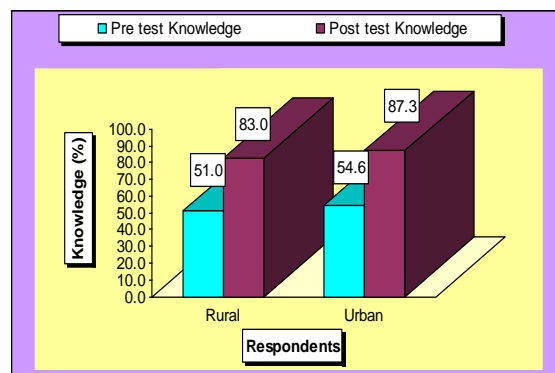


Figure. 1: Pre and Posttest Mean percent Knowledge scores of Rural and Urban adolescent girls on Teenage Pregnancy

**TABLE: 2- Overall Mean Attitude scores of rural and urban adolescent girls regarding Teenage pregnancy.**

N=60

Adolescent girls	Sample (n)	Pre test			Post test			Paired 't' test
		Mean	Mean (%)	SD	Mean	Mean (%)	SD	
Rural	30	36.43	75.90	8.3	43.33	90.28	9.6	10.94*
Urban	30	36.67	76.39	10.3	44.82	93.40	5.9	8.79*

\* Significant at 5% Level,

t (0.05, 1df) = 2.045

The above table reveals that post-test mean percent attitude score was found higher 90.28% when compared with pre-test mean percent attitude score value which was 75.90% among rural adolescent girls. Similarly among urban adolescent girls, the post-test mean percent attitude score was found higher 93.40% when compared with pre-test mean percent attitude score value which was 76.39%. Further, the mean percent enhancement score of rural and

urban adolescent girls was 14.38% and 17.01% respectively. It indicates the effectiveness of STP in changing the attitude among the adolescent girls. This is depicted in fig.2

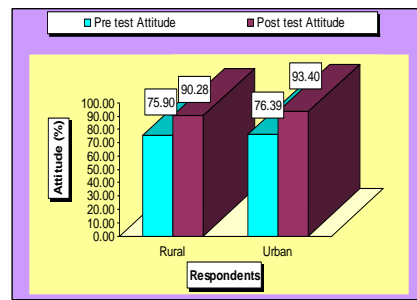


Figure. 2: Pre and Posttest Mean percent Attitude scores of Rural and Urban Adolescent girls on Teenage Pregnancy

**Table: 3-Comparison of Effectiveness of STP in Enhancing Knowledge and Attitude among Rural and Urban Adolescent girls.**

N=60

Area	Knowledge Enhancement				Attitude Enhancement			
	Mean	Mean (%)	SD (%)	t-value	Mean	Mean (%)	SD (%)	t-value
Rural	11.17	31.9	7.8	0.8 <sup>NS</sup>	6.90	14.38	7.2	1.26 <sup>NS</sup>
Urban	11.47	32.8	8.5		8.17	17.01	10.6	

NS: Non significant

t (0.05, 2df) =1.96

Table-3 which reveals that among urban adolescent girls, the mean percent enhancement of knowledge score was found 32.8% and SD of  $\pm 8.5$  when compared with rural mean percent knowledge score value which was 31.9% with SD of  $\pm 7.8$ . The statistical value implies that the difference among the rural and urban adolescent girls found statistically non-significant at  $p < 0.05$ . Hence the effectiveness of STP was same in enhancing knowledge among rural and urban adolescent girls. Similarly Attitude among Rural and Urban adolescent girls, which shows that among urban adolescent girls, the mean enhancement of attitude score was found 17.01% and SD of  $\pm 10.6$  when compared with rural mean percent attitude score value which was 14.38% with SD of  $\pm 7.2$ . The statistical 't' value implies that the difference among the rural and urban found statistically non-significant at 5% level. Hence the effectiveness of STP in enhancing attitude was same among rural and urban adolescent girls.

**TABLE: 4- Correlation between knowledge and attitude among rural and urban adolescent girls regarding teenage pregnancy.**

N=60

Area	Sample (n)	Correlation between knowledge and attitude scores	
		Pre test	Post test
Rural	30	R = +0.297	r = +0.256
Urban	30	R = +0.302	r = +0.130

Table 4 indicates the correlation between knowledge and attitude was found positively correlation with the 'r' value of +0.297 in pretest and r=0.256 in posttest among rural adolescent girls. Similarly, among urban adolescent girls the knowledge and attitude were found positive correlation with 'r' value of +0.302 in pretest and r=+0.130 in posttest. The correlation coefficient 'r' value implies that positive correlation between the knowledge and attitude among rural and urban adolescent girls.

TABLE -5 Association between Demographic variables and Pretest Knowledge level on Teenage pregnancy

N=60

Demographic Variables	Category	Sample	Respondents Knowledge				X <sup>2</sup> value	p Value
			Inadequate		Moderate			
			N	%	N	%		
Age Group (years)	14-15	52	22	42.3	30	57.7	1.14	> 0.05
	16-17	8	5	62.5	3	37.5	NS	
Area of Residence	Rural	30	17	56.7	13	43.3	3.30	> 0.05
	Urban	30	10	33.3	18	66.7	NS	
Type of Family	Nuclear	37	18	48.7	19	51.3	0.52	> 0.05
	Joint	23	9	39.1	14	60.9	NS	
Ordinal position	First	24	10	41.7	14	58.3	0.66	> 0.05
	Second	19	10	52.6	9	47.5	NS	
	Third	17	7	41.2	10	58.8	NS	
Education of Mother	Illiterate	36	20	55.6	16	44.4	6.23*	< 0.05
	Primary	11	5	45.5	6	54.5		
	Middle & Above	13	2	15.4	11	84.6		
Occupation of Mother	Housewife	35	12	34.3	23	65.7	8.97*	< 0.05
	Daily wages	12	10	83.3	2	16.7		
	Employed	13	5	38.5	8	61.5		
Family Income/month	Rs.1000-2000	21	13	61.9	8	38.1	16.52*	< 0.05
	Rs.2001-4000	18	12	66.7	6	33.3		
	Above Rs.4001	21	2	9.5	19	90.5		
Total								



Table 5 depicts, there was significant association between education and occupation of mother and family income with pre-test knowledge scores. There was no significant association between the variables like age, area of residence, type of family, ordinal position with pre-test knowledge scores.

#### IV. DISCUSSION

**4.1. Overall pre-test and post-test knowledge scores of rural and urban adolescent girls on teenage pregnancy:**-The result reveals that among rural adolescent girls the post test mean percent knowledge score was found to be higher 83% with SD of  $\pm 8.4$  when compared with pre test mean percent knowledge score value which was 51% with SD of  $\pm 11.7$ . Similarly, among urban adolescent girls, the posttest mean percent knowledge score was found higher 87.3% with SD of  $\pm 6.4$  when compared with pretest mean percent knowledge score value which was 54.6% with SD of  $\pm 10.7$ . Further, the mean enhancement score of rural and urban adolescent girls was 31.9% with SD value of  $\pm 7.8$  and  $\pm 32.8$  with SD value of  $\pm 8.5$  respectively which reveals that there exists a statistically significant in the enhancement scores indicating the effectiveness of STP among the adolescent girls. This study was supported by a study done by Jayashree to evaluate the effectiveness of planned teaching programmed on selected aspects of reproductive health among the rural adolescent girls. In the pretest, 19.77% of the subjects had poor knowledge, whereas post test scores showed that 96.5% of the subjects had good knowledge regarding reproductive health. The findings of the study reveal overall pre-test knowledge about reproductive health was poor. Planned teaching programmed is an effective method to increase the knowledge about reproductive health among rural adolescents.<sup>(5)</sup>

**4.2. Overall pre and post mean Attitude scores of rural and urban adolescent girls regarding Teenage pregnancy:**The results was shows that post-test mean percent attitude score was found higher 90.28% when compared with pre-test mean percent attitude score value which was 75.90 among rural adolescent girls. Similarly among urban adolescent girls, the post-test mean percent attitude score was found higher 93.40% when compared with pre-test mean percent attitude score value which was 76.39%. The statistical paired 't' value implies that the difference in the pre-test and post-test attitude scores of rural and urban adolescent girls found statistically significant at 5% level ( $p < 0.05$ ). Hence  $H_2$  is accepted. Further, the mean enhancement score of rural and urban adolescent girls was 14.38% and 17.01% respectively. It indicates the effectiveness of STP in changing the attitude among the adolescent girls.

**4.3. Comparison of Effectiveness of STP in Enhancing Knowledge and Attitude among Rural and Urban Adolescent girls:** Results shows that among urban adolescent girls, the mean percent enhancement of knowledge score was found 32.8% and SD of  $\pm 8.5$  when compared with rural mean percent knowledge score value which was 31.9% with SD of  $\pm 7.8$ . The statistical 't' value implies that the difference among the rural and urban found statistically non-significant at 5% level ( $p < 0.05$ ). Hence the effectiveness of STP was same in enhancing knowledge among rural and urban adolescent girls. Similarly attitude among Rural and Urban adolescent girls, which shows that among urban adolescent girls, the mean

percent enhancement of attitude score was found 17.01% and SD of  $\pm 10.6$  when compared with rural mean percent attitude score value which was 14.38% with SD of  $\pm 7.2$ . The statistical 't' value implies that the difference among the rural and urban found statistically non-significant at 5% level ( $p < 0.05$ ). Hence the effectiveness of STP was same in enhancing attitude among rural and urban adolescent girls.

**4.4. Correlation between pretest and posttest knowledge and attitude scores of rural and urban adolescent girls:** The findings reveals that the knowledge and attitude was found positively correlation with the 'r' value of +0.297 in pretest and  $r = 0.256$  in posttest among rural adolescent girls. Similarly, among urban adolescent girls the knowledge and attitude were found positive correlation with 'r' value of +0.302 in pretest and  $r = 0.130$  in posttest.

This study was supported by a study conducted by Birungi to determine student's knowledge, attitudes and practices of safer sex methods. The knowledge and use of safer sex were low. Students had inadequate knowledge and attitude towards safer sex practices and it shows that positive relationship between knowledge and attitude towards use safer sex practices, possible risks of transmission of HIV infection and there was refusal to use condoms because of myths and misconceptions about them, therefore there is a big need to intensify sex education both at school and home. (6)

**4.5. Association between Demographic variables and Pretest Knowledge and Attitude level on Teenage pregnancy:** There was significant association between education and occupation of mother and family income with pre-test knowledge scores. Chi-square value is higher than the table value at 5% level. There was no significant association between the variables like age, area of residence, type of family, ordinal position with pre-test knowledge scores. There was significant association between the variables like occupation of mother with pre-test attitude score. There was no significant association between the variables like age, area of residence, type of family, ordinal position education and occupation of mother, family income with pre-test attitude score. This study also supported by another study done by Arnold to determine which factors predicted changes in knowledge and beliefs among middle school students after exposure to postponing sexual involvement (PSI), the curricular component of education now and babies later, a pregnancy prevention program. It was found that the single most important predictor of improvement in knowledge and beliefs about pregnancy prevention was PSI itself, not background demographic variables. (7)

**V. CONCLUSION:-**It can be inferred that the mean knowledge and attitude score of the adolescent girls regarding teenage pregnancy were inadequate in the pretest. The structured teaching programmed was considerably same effective<sup>1</sup> in enhancing the knowledge and changing attitude of both rural and urban adolescent girls and found to be significant in all the aspects of under study.

**5.1 Implication to nursing practice.:-**Education programmes on teenage pregnancy conducted by the nursing personnel both in the hospital and community area helps in preventing teenage pregnancy. The nurse plays an important role in disease prevention and

health promotion. Education programmes with effective teaching strategies, and audio-visual aids motivate people to follow healthy practices in day-to-day life, involving changes in life style.

**5.2 Limitation:-**Generalization of findings is limited as sample was restricted to selected urban and rural high school in Bangalore. Lack of random sample technique hinders the generalization of results. The study did not have a control group hence the results of the study must be generalized with caution

**Acknowledgement:-**

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## **IMPORTANCE OF DIGITAL LIBRARY AND INFORMATION IN MORDEN EDUCATION AND RESEARCH**

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**ABSTRACT:-**In last 15 years, digital library has evolved significantly, & function of digital library & digital information has expanded significantly. After emergence of digital resources & digital information, Information Communication Technology (ICT) has impact on e-learning & digital learning. Now, everything is easily available in online digital form, & users may connect to online information via internet. In comparison to other countries in world, India has strong position in use of digital information; in last 3 to 6 years, our digital information development has taken lead in all areas of education, including library sections, & has altered way people live. Filtering proper information from online digital information is critical in today's world. Modern digital libraries provide digital material to researchers in variety of formats in order to improve quality of education & research. Many leading publishers are digitising information & making it available to users in form of online resources & digital databases in modern digital era. This type of information is extremely useful, & research scholars & academicians use it as research tools in libraries 24 hours day, seven days week. When it comes to online education based on internet, there are numerous advantages over traditional libraries, such as ability to access information at any time & from any location, ability to present information in multimedia format, & creation of equal educational opportunities for all nations. It prompted people to pay attention to this type of schooling. In contrast to traditional libraries, digital libraries can make services & library materials available over internet to assist eLearning.

**KEY WORDS -** Digital Library, Information, E- Learning, Education.

**INTRODUCTION:-**After rise of Internet & digital technologies, world of scholarly printing & publishing has changed dramatically & quickly. In early 1970s, digital libraries were constructed around mini & mainframe computers to provide remote access to online databases as well as online search & retrieval services utilizing computer & communication technology available at time. Since concept was initially presented in 2003 in form of Institutional Repository (IR), total 5200 institutions around world have embraced Institutional Repository to store material in digital form in digital library. These shifting intellectual communication methods present both new issues & new possibilities for university libraries,

which are responsible for maintaining & providing access to intellectual record & information.[1] Mobile apps, tablets, iPads, laptops, computers, digital books readers, digital screens, & other digital information mediums are easily found on internet & can be accessed directly after subscription & registration through mobile apps, tablets, iPads, laptops, computers, digital books readers, digital screens, & other digital information mediums. In short period since its introduction, information & communication technology (ICT) has potential to improve people's lives. Education is one of areas that have seen lot of changes. Importance of ICT in learning cycle cannot be overstated. People should study & write regularly in traditional type of education, & whole flow of instruction is roughly unilateral. Individuals require ICT use skills in addition to fundamental abilities while using ICT in education. Learning based on new information technologies, along with major modifications in traditional education conceptions, was able to address several defects & weaknesses in educational institutions, resulting in significant educational reform. Use of virtual world in education resulted in innovative & acceptable ways. benefits of ICT in education include better, easier, & quicker learning. There is no requirement to attend face-to-face or physical classes in this manner, & it is envisaged that learning will become accessible outside of physical locations in way that allows learners to freely exchange & use information. Instructors & librarians' roles will shift as result of this transformation. [2]

### **What is Digital Library?**

A digital library, also known as digital repository or digital collection, is online database of digital content that contains text, photos, audio, video, & other digital media types. "Digital Libraries are organizations that provide resources, including specialized staff, to select, structure, offer intellectual access to interpret, distribute, preserve integrity of, & ensure works are readily & economically available for use by defined community or set of communities," according to Digital Library Federation (1999). "The notion of digital library is not only comparable to digitized collection with information management tools," writes Paul Dugout (1997). It is rather ecosystem that brings together collections, services, & people to enable whole life cycle of data, information, & knowledge generation, distribution, use, & preservation." "A digital library service is assemblage of digital computing, storage, & communications machinery together with software needed to emulate & extend services provided by conventional libraries based on paper & other material means of collecting, storing, cataloguing, finding, & disseminating information," according to Gladney, H.M., et al. (1994). [3]

### **Education & Libraries**

In general, libraries, both conventional & digital, serve three functions in education: they serve as hub for exchanging knowledge, preserving ideas, & bringing people together to achieve common goals. Each library's primary goal is to assist, facilitate, & enhance formal education in main organization. next phase is to encourage informal learning. Library resources are gathered to aid in learning. In opposed to conventional libraries, which are limited by location & time, digital libraries give instantaneous access to large range of materials that do not exist physically. Without physical barriers, digital libraries may deliver resources at anytime & from any location via internet connection. Because of these benefits, studying in digital libraries is self-contained activity. Because they include up-to-date content, digital libraries give adequate chances for learners. Remote learning was made possible by collecting multimedia resources. Digital libraries have aided electronic & networked learning by storing & retrieving educational material from computer networks. Access to up-to-date eLearning resources is difficult without availability of structured & preserved electronic materials by digital libraries. [4]

### **Generation of several libraries**

Libraries were developed in five phases from structural standpoint:

1. Traditional libraries: majority of resources in these libraries are printed items. majority of library services, such as cataloguing, categorization, & reference support to clients, are performed by librarians manually.
2. Automated libraries: materials did not alter or differ from first generation, but automated & computational machinery disrupted library services.
3. Electronic libraries: electronic resources are added to printed texts in this age. However, large portion of library's electronic services were unavailable.
4. Digital libraries: distinguishing aspect of this generation is speed with which users may access variety of materials & services.
5. Virtual libraries: "Libraries without Walls" is word that describes this generation. This implies that all library materials, services, & access are available over web. [5]

### **Digital Libraries**

Libraries' services & methods of access to them have evolved & transformed in virtual world as eLearning has grown & expanded in universities & higher educational institutions. Notion of digital library, which emerged in 1993 as result of emergence of internet, has long been recognised by librarians & educational professionals as greatest instrument for providing services & distributing instructional content to learners during virtual education

courses. Understanding digital library concepts necessitates wide range of perspectives & inferences through time, as well as several definitions. Even among professionals who played key roles in development & use of term "digital library," there is no consensus. For librarians, digital libraries have same functionality as traditional libraries but in new format; for computer professionals, digital library is distributed text-based information system or multimedia networked information system; & for end users, digital library is similar to internet but with better function, organization, compatibility, & usability [6].

Shire references Digital Library Federation's operational definition of digital library. "Organizations that provide resources, including specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve integrity of, & ensure persistence over time of collections of digital works so that they are readily available for use by defined community or set of communities," according to definition of digital library. He emphasized three things in this concept as part of "theoretical framework supporting digital libraries: [7]

1. People;
2. Information resources; &
3. Technology.

Overall, digital library is collection of digital works (e.g., texts, photographs, videos) that may be utilized by customers, as well as collection of connected procedures & services for gathering, organizing, & protecting such works. Journals, proceedings, books, multimedia, & other materials are arranged for remote access in digital libraries. Digital library is more than simply collection of electronic resources; it also includes web interface, maybe virtual community, & physical venue. Data is rapidly available for any individual in every part of world via communication networks via this technology. Digital library is more than single entity; it is comprised of several resources & collections that must be handled. Resources in digital library are classified into two categories: a) resources that are generated in digital form from start, such as eBooks or e-Journals, & b) non-digital resources that can be converted to digital over time. [8]

According to Walter, there are three main approaches to creating digital library:

1. Library digitization & information preservation;
2. Acquisition of digital-based resources offered by publishers, organizations, & researchers;
3. Access to works not in library collection via linkages to other libraries' websites & publishers' servers.

We now have many digital or online libraries, some of which are very wonderful; it is very quick procedure that expands our ability to store books, articles, seminars, pictures, audio

videos, & other reading materials; we currently have many digital or online libraries, some of which are very wonderful. Majority are excellent sources of information, but some, such as those included below, contain books, journals, maps, videos, & audio/video books that would be difficult to locate in print. [9]

### **World Digital Library (WDL)**

Manuscripts, rare & exceptional books, videos, maps, & other items in multilingual format can be found here.

### **Universal Digital Library**

The Universal Digital Library (UDL) is collection of it houses millions of volumes & is extremely valuable for academic education & research.

### **Project Gutenberg**

Project Gutenberg is popular platform with 33000 e-books available to read & download at any time & from any location.

### **Barthleby**

There is large library of books available for consultation, including novels, essays, poetry, & other classical literature.

### **Google Books.**

Google Books is highly beneficial platform for studying variety of areas that is also quite accessible; it has over 100,000 open & paid books for users to choose from.

### **Ibblio**

It's partnership of various libraries & information technology that includes e-books, academic journals, software, music, & radio broadcasts.

### **Internet Archive**

It is world's biggest digital collection of eBooks & audio books, with all sources available for free download.

### **Open to public**

It is free to use & contains millions of eBooks of great literature that may be downloaded quickly for study. [10]

### **What's difference between conventional & digital libraries?**

The following are most significant distinctions between digital & conventional libraries:

1. Is it better to be local or global?

One of common characteristics of internet is feeling of being out of place. With introduction of networked communication & ability to access resources via network, active domains of libraries shifted to become more worldwide in terms of collection & services.



## 2. What is difference between just-in-case & just-in-time planning?

Collection development is often continual activity aimed towards achieving library's main goal. If library lacks necessary resources, it will be unable to satisfy users' requests immediately. In other words, tendency in non-electronic libraries is to build collections "as required." However, because remote access allows for resource retrieval, next trend in collection development will be "just in time." This approach places premium on providing prompt & satisfactory answer to consumers' inquiries. Although both "when required" & "just in time" tendencies are significant, libraries must decide how to manage & balance them according to their collection development policies.

## 3. Accessibility vs. Ownership

Traditional libraries keep tangible items, but today's vast amounts of data are saved electronically as digital objects that may be shared among computers. It may appear that accessibility is more crucial than ownership in meeting consumers' immediate demands, but this is not case. Accessibility & ownership are mutually beneficial. If library focuses just on accessibility & ignores ownership, it will become nothing more than network. In this way, publishers will have exclusive access to resources, & library will become "lifeless & ghostly" system with some outdated & out-of-date materials. For some readers, reading electronic materials lacks qualification & enjoyment of reading traditional materials, particularly in realms of literature & history. Library may serve clients with various interests by combining printed & digital materials at same time.

## 4. Coordination vs. Separation

Users of digital libraries do not need to physically visit library to obtain information. Most of time, library provides more than just circulation of resources; it also delivers accurate information. Through addition to collecting data, library makes collections accessible to users directly or indirectly through arranging resources in networks. Libraries must gather & arrange digital works online through networked communication, it might be argued. Cataloguing & document delivery services, for example, are now closer to increasing their collections than they were previously. As result, there are fewer gaps between technological & public services for users, & it is no longer out of question to merge them.

## 5. Information circulation is being accelerated.

In network, everyone who is author is also publisher. In present instant, information circulates. Information is being created & shared at greater rate than ever before. Libraries have issues as result of rapid flow of information. As result, they'll need new strategic approach to online data acquisition. [11]

## **E-Education**

Extensive changes in ICT have had impact on education & learning, resulting in new style of learning known as eLearning. It was just born in previous several decades. In 1920s, educational broadcasting was commonplace. Microfiches & overhead projectors were used to introduce students to new ways of learning. However, development of computers in 1960s resulted in far-reaching rise of eLearning. At time, students were aware of instructional use of computers. To instruct, they initially utilized main computers, then personal computers. After advent of web & development of internet, growth & influence of ICT in education, as well as its exceptional transformation, became obvious & palpable in 1990s. This influence resulted in liberation from conventional learning & hopeful revolution of learning for everyone from every nation, location, & time. e-Learning has advantages, capabilities, & benefits above traditional education. E-learning is less expensive. There is greater capacity to regulate learning process by including learners in it, as well as capacity to quickly modify content of educational materials. In addition, obstacles to accessing learning resources are removed. Libraries & information centres, according to Sacchan and, play significant role in improving qualification of electronic educations. Information workers & librarians, according to Doherty, Hansen, & Kaya, must serve as "learning facilitators" rather than simply delivering or protecting information in order to improve & transmit in educational process. They must transition from information curator to information accelerator educator. [12]

**CONCLUSION:-**Libraries' most common responsibilities include providing infrastructure to support, produce, organize, & disseminate knowledge. Former libraries aided learning in past by enhancing educational collections, equipment & facilities for studying, qualified reference services, & book accessibility. Digital libraries, on other hand, assist learners by delivering digital materials & innovative library services. Naturally, assuming digital libraries as digitalized collection cannot be effective in education, because they are confined to storage & retrieval technologies, & basic library functions are ignored. For example, collection development, reference services, information literacy training, proper task selection, & so on, as well as existence of human factors. On other hand, for both specialists & librarians, proper recognition & knowledge of eLearning, as well as investigating technical & human elements of eLearning & its relationship to digital libraries, can be beneficial in reinforcing & improving learning. Because of multidisciplinary nature of digital library idea, specialists such as librarians & information science specialists, computer & information technology scientists, teachers, & others must collaborate & help. To make sense of scientific

cooperation & information exchange, digital libraries must promote learning & education & strengthen relationships between learners & instructors.

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## Isolation and characterization of saline soil action-bacteria producing pectinase and its antibacterial activity

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**Abstract:-** Saline soil of Akola region was selected to study the actinobacteria which are able to produce pectinase enzyme. The scale, aerial mycelium, and Gram's staining were used to determine the morphological characteristics of selected isolates, and the majority of the actinomycetes which is isolated produced grey and white aerial mycelium on nutrient agar. On starch casein agar medium, the strain developed well and showed zone of hydrolysis. It was further subcultured on pectinase screening agar medium. By using primary screening, 6 strains were chosen based on their pectinase activities. Pectinase activities were observed in strains from a variety of locations, including Gopal Gandhi Gram (GGA), Mhaisang (MA), Hingna Tamaswadi (HTA), Wadad Kh (WA), Kati (KA), Bramhpuri (BA). They were verified by the development of a strong hydrolysis zone around the colonies. Wadad Kh had the highest pectinase activity among these isolates (WA4). At the same time potential isolates were checked for antibacterial properties against *Escherichia coli*, *Pseudomonas aeruginosa* and *Bacillus subtilis* showed zone of inhibition around the colonies of these bacteria.

**Key Words:-** Actinomycetes, saline soil, pectinase production, starch casein agar (SCA), antibiotic.

**[I] Introduction:-** Enzymes are complex, life-generated proteins [9]. Soil microorganisms such as bacteria, fungi, and nematodes produce different organic cellular enzymes [22]. Actinomycetes are members of the order Actinomycetes, a separate taxonomic category in the field of bacteria [7]. Actinomycetes are gram-positive bacteria that grow in filaments, similar to fungi. It is also widely distributed in nature and aerobic, in G+C along with high DNA. [15]. Actinomycetes in dry alkaline soil, they are predominantly. Actinomycetes document the secondary metabolite assembly. The merchandise of actinomycetes is numerous antibiotics currently used, such as gentamicin, streptomycin, erythrose, and rifamycin. The actinomycetes are not only crucial for the pharmaceutical industry but also agriculture. A previous study showed that the expansion of several tested herbal pathogens is inhibited by actinomycetes isolated from Malaysia's soil [12]. Actinomycetes have adaptive forms involving fungi and bacteria, and a mycelium web of branching can be formed. However, they are thin, contain muramic acid in cell walls, have an antibacterial nucleus, and are vulnerable to antibiotics [19, 27]. They are also considered adaptive forms. The filament is gram-positive, non-motile, non-portable, unencapsulated, hacking into bacillary and cocci [3, 14, and 23] elements. They are Gram-positive bacteria and, as the term actinomycete mainly aerobic with high G+C [6], they have some morphological characteristics with fungi [25]. They are also gram-positive. Filamentous growth is present, mycelium aerial or substratum-based production, and the soil's earthy smell takes place in Actinomycetes [7].

*Actinomycetes* species able to produce bioactive substances and antibiotics. Chemical structure of antibiotics produced by actinobacteria varies in components like anthracyclines, glycosides, actinomycins and tetracycline. [42] From recent studies it was observed that antibiotics from actinobacteria have importance in medical field.

[44] 80% of antibiotics in the world comes from *Micromonospora* and *Streptomyces* of actinobacteria [43]

The River Purna proceeds along Vidarbha region districts including Amravati, Akola and Buldhana which meets Tapi River and in the end at the Arabian Sea [49]. Purna river basin has 547 villages which come under as saline region belt. Saline soil belt of these 3 district has pH of 7.9 to 9.1 which is mentioned as highly alkaline.[50] In the current study we endeavour to isolate alkaline actinomycetes from Akola region saline soil and studied its antibacterial activity against test bacteria.

Pectin is biologically degraded by pectinase enzyme [5]. Pectins are polysaccharides having high molecular weight made up of  $\alpha$ -1 $\rightarrow$ 4 linkage including D galacturonic acid residues with a few rhamnose residues in the main chain and on side chain arabinose, galactose and xylose[13]. Pectinase enzymes are included three enzymes viz. poly galacturonase, pectine sterase, and pectate lyase based on their role on the pectin degradation [17]. Pectinase are mainly employed in food sector, cosmetic and pharmaceutical industries [18,30]. As extraction of medicinal plants seeds by chemical solvents are harmful to human health, enzymeassisted extraction is a green extraction technique. Pectinase enables the release of cell components with cell wall degradation [29].

The species of *Actinomyces*, on the other hand, frequently maintains the anaerobic environment in microaerophilia conditions [8, 24]. Pectinases have maximum enzyme production in the market of the world and much global sale in the various food and other industries.[32-34] Pectinases are extensively used in the wine production industry, the pulp and papermaking processes, the vegetable waste treatment, fruit juice extraction, and for the tea, and coffee fermentations.[32,35–36,37]. Viscosity is reduced in clarification of juice of fruits as well the yield of juice increased by liquefaction of enzymes and process of pulping [36,38,39] Varrious sources like bacteria, fungi, yeasts, insects, nematodes, plants, and protozoan are able to produce pectinases[33,41,34] In last few years, due to the need of economic production of enzymes and search of strains of bacteria producing pectinases have been studied comprehensively.

*Streptomyces* in soils like 90% of the isolates is one of the largest common actinomycete ge-nuts. Nevertheless, new approaches have been shown to isolate soil actinomycetes and to isolate many new genera. Most new species are also ready to produce new secondary taboos [16]. Although there were reports of the primary antibiotic from the actinomycete 50 years ago [20] and since then, there have been 4000 new bioactive compounds, the design of brand new actinomycetes of biotechnological interests remains essential. [11].

It was not sufficient for actinomycetes to be identified alone through microscopic methods to form certainty. The only way to identify actinomycetes at their species-level would be biochemical methods. Nevertheless, this test uses chemicals for a long time. Researchers have specialized in the 16S rRNA sequence of actinomycetes to advance molecular study technology [21, 28]. Actinomycetes were quickly and accurately identified to the genus level. The advancement in the identification planet has been remarkable because it has become possible to push the actinomycetes' genus in fewer hours.

## **[II] Material and Methodology:-**

**2.1 Collection of Soil Sample:-**Collection of saline soil samples from various villages in Akola, Maharashtra, India, including Gopal Gandhi Gram (GGA), Mhaisang (MA), Hingna Tamaswadi(HTA), Wadad Kh (WA), Kati (KA), Bramhpuri(BA). Approximately below the

soil surface of 15 cm have been collected, soils samples have then been packaged during a zip-lock bag and stored during transport in an ice-pack container (~4 °C), then separately secured for 1 hour at temperature of 45°C during a hot air oven and then cooling was done[4, 10].

**2.2 Isolation of Actinomycetes:-**Sterile water of 9 ml containing culture tubes were taken; one ml of suspension from the inventory culture was transferred to the primary tube aseptically (10-1), and the well was mixed. An additional serial dilution has been carried out to provide 10-5 suspensions. 0.1 mL culture tube suspension has been aseptically spread over a laminar-air flow cabinet on a sterile starch casein agar medium plate. Plate incubation took place for 7 days at 36°C. Along the incubation period, the plates were monitored on an intermittent basis. After 72 hours, whitish pinpoint colonies of actinomycetes were observed, selected, and purified onto actinomycetes agar slants with an inhibitor or a clear inhibitor zone.

**2.3 Selected Actinomycetes Colony Morphological Characteristics:-**Actinomycetes isolates are inoculated and incubated in SCA media at 36°C for seven days, and those colonies have been noted in terms of size, aerial mycelium, and grammes, using a highly powerful lens magnification.

**2.4 Screening of Pectinase Producing Actinomycetes:-**After obtaining colonies, iodine-potassium iodide solution was used to flood the plates (1 g of iodine solution, 5 g of KI solution in distilled water of 330mL) and incubated at 37°C and observed for 15 min.[26,12] Again plates were studied for zone of clearance after incubation.. Colonies of actinobacteria were confirmed by obtaining zone of clearance around them.

**Sub-culturing:-**Sub-culturing of the isolate was carried out on pectinase screening agar medium (PSAM) for further studies.

**Determination of antibacterial activity:-** In some studies it was found that *actinomycete* do not show antibiotic activity in liquid culture but on solid agar. From the results of screening it was observed that many isolates showed activity against Gram-positive and Gram-negative bacteria. Against bacteria like *Bacillus subtilis*, *Pseudomonas aeruginosa* and *E.coli*. antibacterial activity was tested. Using disc-diffusion test antibacterial test was carried out and by observing zone of inhibition on bacterial culture plates effectiveness was calculated.

**[III] Result and Discussion:-**The current study based on isolation of colonies of actinomycetes from saline soil using an actinomycetes-specific media, starch casein agar. 0.1 ml Suspension was aseptically spread on sterile starch-casein agar medium plates using a laminar-air flow chamber. The plates were studied for incubation of 7 days at 36 °C. On-again-off again of the incubation period plates were observed. The supported size, aerial mycelium, and Gram staining of selected isolates are observed. The majority of isolated actinomycetes produced white and grey aerial mycelium, as illustrated in Table no. 1. Gram staining procedures were performed on a loopful of culture and thus, the experts were recorded. Following a 7-day incubation period, Gram staining of selected actinomycetes colonies was performed using gentian violet, Gram's iodine, alcohol, and safranin. Slide observed through a lens of 100X oil immersion. Actinomycetes which were isolated have a purple cell membrane due to gentian violet; therefore, it was confirmed that they are actinomycetes having Gram-positive character. If bacteria are Gram-negative, they will lose the first stain and take the secondary stain, giving red when viewed under a microscope. Additionally, slide culture observation indicates that the isolates were Streptomyces SPS.

The study focused on to isolate, screen, and characterize bacteria from saline soil able to produce pectinase. This purpose was accomplished using starch casein agar medium showing hydrolysis to the colony diameter after three days of incubation. The diameter of the hydrolysis zone was determined following incubation. The optimal temperature for isolating species required for the enzyme's production and activity was found to be 35°C. Around 32 isolates (bacteria) activity was observed on SCA agar. Among 32 isolates 6 of samples were selected, and 26 were eliminated based on similar colony size and diameter less than 6.5 mm. The highest clearing zone of 8.5 mm among 8 isolates was shown in Table 1 and 2. The figure depicts a comparison of various isolates showing a zone of clearance [31] [32].

The isolates exhibited the activity against selected pathogenic bacteria. Antibiotic activity was determined using *Escherichia coli*, *Pseudomonas aeruginosa* and *Bacillus subtilis* strains and results showed zone of inhibition surrounded bacterial colonies. [51] Difference in the sensitivity among microorganisms was obtained due to different morphology structure. The reason behind is the property of cell wall of Gram-negative bacteria which has lipo polysaccharide compounds in outer membrane which is made up of polysaccharides.

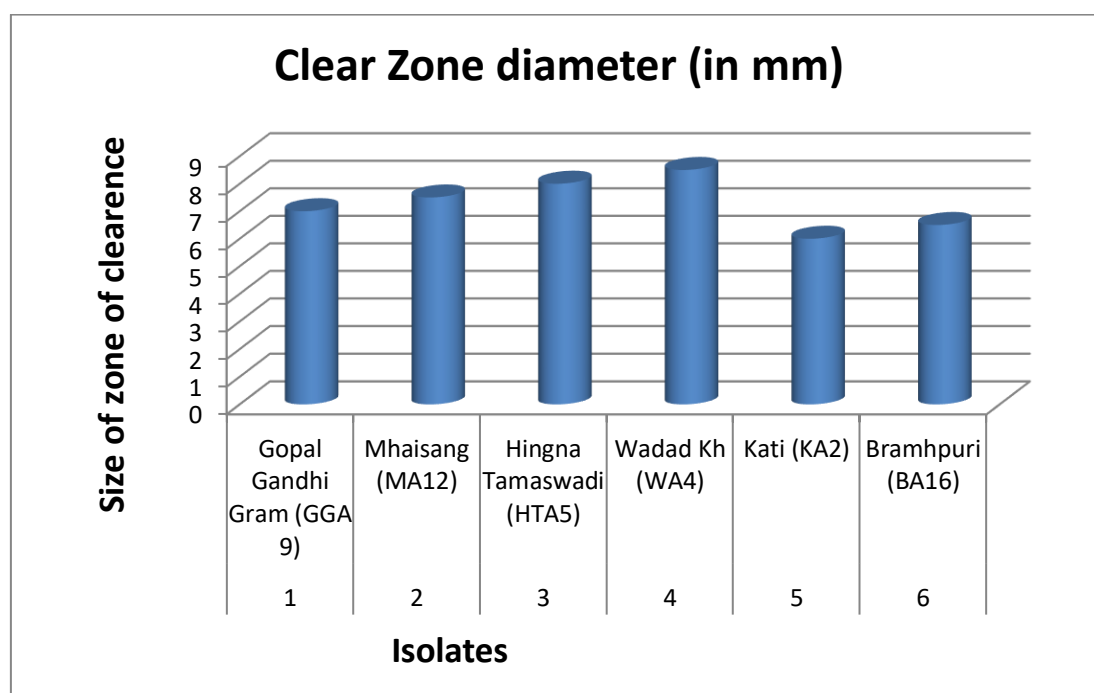
In case of Gram-positive bacteria it should be much susceptible and but merely outer peptide glycon layer has not the property of permeability barrier. The screening results of the isolates which were active against test organisms as showed in table 3.

**Table 1: - Characteristics of Selected Actinomycetes Colony**

characteristics	Gopal Gandhi Gram (GGA 3)	Mhaisang (MA1)	Hingna Tamaswadi (HTA4)	Wadad Kh (WA4)	Kati (KA2)	Bramhpuri (BA5)
<b>Aerial mycelium</b>	Grey	grey	White	white	Light grey	grey
<b>size</b>	Medium	Small	Small	Small	Medium	Small
<b>Gram staining</b>	Positive	Positive	Positive	Positive	Positive	Positive
<b>Production Of pectinase enzyme</b>	Positive	Positive	Positive	Positive	Positive	Positive

**Table 2: - Clear zone diameter (in mm) produced by isolates due to production of 52cellulose**

Sr. No.	Isolates	Clear Zone diameter (in mm)
1.	Gopal Gandhi Gram (GGA 9)	7
2.	Mhaisang (MA12)	7.5
3.	Hingna Tamaswadi (HTA5)	8
4.	Wadad Kh (WA4)	8.5
5.	Kati (KA2)	6
6.	Bramhpuri (BA16)	6.5



**Figure 1: Comparison of different isolates showing zone of clearance**

**Table 3:- Selected isolates of Actinobacteria showing antibacterial activity**

SR NO	Code of Isolate	Zone of inhibition		
		<i>E.Coli</i>	<i>P.aeruginosa</i>	<i>B.subtillis</i>
1	GGA 9	-ve	+ve	-ve
2	MA12	-ve	+ve	+ve
3	HTA5	+ve	-ve	-ve
4	WA4	+ve	+ve	-ve
5	KA2	+ve	+ve	+ve
6	BA16	+ve	-ve	-ve

**[IV] Conclusion:-**The current research focuses on how to isolate and characterize actinomycetes that produce pectinase from saline soil sample. The present study collected soil samples from various locations throughout Akola. Pectinase production was initiated by inoculating the isolate onto SCA agar for three days. Gram staining was used to identify the bacterial isolates morphologically. From these soil samples, 32 actinomycetes were isolated. Only six of these 26 isolates demonstrated the maximum pectinase. Wadad Kh (WA4), which has shown high pectinase activity by observing SSCA agar plate area with the enzyme's maximum production and activity being 8.5 mm diameter of the zone. Besides this given isolate showed the antibacterial activity by showing zone of inhibition around the selected Gram-negative and Gram-positive pathogen (*Escherichia coli*, *Pseudomonas aeruginosa* and *Bacillus subtilis*).

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## **Pilot study report on impact of Awareness Teaching Programme on behavioral outcomes regarding sexual violence among adolescent girls from selected schools of Bangalore**

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**Abstract:-** Sexual violence is a common and serious public health problem affecting millions of people each year throughout the world. It is driven by many factors operating in a range of social, cultural and economic contexts. At the heart of sexual violence directed against women is gender inequality. “Pilot study report on impact of awareness teaching programme on behavioral outcomes regarding sexual violence among adolescent girls from selected schools of Bangalore.”

**Objectives:**1] To assess the pre-existing knowledge regarding sexual violence among adolescent girls from selected high schools of Bangalore before the intervention.2] To find out pre-existing perception of sexual violence among adolescent girls from selected high schools of Bangalore before the intervention.3] To design and develop awareness teaching program on sexual violence.4] To determine the effectiveness of awareness teaching program on behavioral outcomes regarding sexual violence among adolescent girls from selected high schools of Bangalore after the intervention.5] To compare the pre-test result score with post-test result score of behavioral outcomes regarding sexual violence among adolescent girls from selected high schools of Bangalore . 6] To find out association of behavioral outcomes regarding sexual violence among adolescent girl’s with their selected demographical variables.

**Methodology:-** Pre Experimental research design (One group pre test post test) was used 40 adolescent girls were selected by using purposive sampling technique. The following tool was used for collecting the data is Performa for personal variables, knowledge of sexual violence and attitude regarding sexual violence. **Results:** In pre test majority of them 21(52.5%) had poor knowledge and 16 (40%) had average knowledge and 03 (7.5%) had good knowledge. In post test majority, 32 (80%) had good knowledge and 08 (20 %) of them had average knowledge regarding sexual violence. In pre test majority of them 23(57.5%) had unfavorable attitude and 17(42.5%) had favorable attitude. In post test all 37 (93%) were having favorable attitude and 3 (7%) were having unfavorable attitude towards sexual violence.

**Key words:-**Sexual violence, Adolescent girls, awareness training programme, behavioral outcomes, impact.

**Introduction:-** Violence against women is a pervasive complex phenomenon that destroys women's feelings of love, trust, and self-esteem. In this commentary, we specifically focus on sexual violence against adolescent girls, whose impact is particularly harmful since it may lead to impaired mental health, social functioning, and neurodevelopment. Between 12% and 25% of adolescent girls throughout the world experience sexual violence, very often perpetrated by a family member or a friend. Sexual abuse also referred to as molestation, is the forcing of undesired sexual behavior by one person upon another. When that force is immediate, of short duration, or infrequent, it is called sexual assault. The offender is referred to as sexual abuse or molester. When the victim is younger than the age of consent, it is referred to as child sexual abuse.

### **Objectives of the study:**

- 1] To assess the pre-existing knowledge regarding sexual violence among adolescent girls from selected high schools of Bangalore before the intervention.
- 2] To find out pre-existing perception of sexual violence among adolescent girls from selected high schools of Bangalore before the intervention.

- 3] To design and develop awareness teaching program on sexual violence.
- 4] To determine the effectiveness of awareness teaching program on behavioral outcomes regarding sexual violence among adolescent girls from selected high schools of Bangalore after the intervention.
- 5] To compare the pre-test result score with post-test result score of behavioral outcomes regarding sexual violence among adolescent girls from selected high schools of Bangalore .
- 6] To find out association of behavioral outcomes regarding sexual violence among adolescent girl's with their selected demographical variables.

**Hypothesis:****Hypothesis will be tested at 0.05 level of statistical significance:**

H<sub>0</sub>. There will be no significance difference between pre-existing knowledge regarding sexual violence among adolescent girls from selected high schools.

H<sub>1</sub>. There will be significance difference between pre-existing knowledge regarding sexual violence among adolescent girls from selected high schools.

H<sub>0</sub>. There will be no significance difference of attitude regarding sexual violence among adolescent girls from selected high schools.

H<sub>2</sub>. There will be significance difference of attitude regarding sexual violence among adolescent girls from selected high schools.

H<sub>0</sub>. There will be no significant association between pre-test score with post-test score on behavioral outcomes regarding sexual violence among adolescent girls from selected high schools.

H<sub>3</sub>. There will be significant association between pre-test score with post-test score on behavioral outcomes regarding sexual violence among adolescent girls from selected high schools.

H<sub>0</sub> There will be no significant association of behavioral outcomes regarding sexual violence with their selected demographical variables.

H<sub>4</sub> There will be significant association of behavioral outcomes regarding sexual violence with their selected demographical variables.

**Research Methodology:**

**Research Approach:** Quantitative research approach

**Research design:** Pre experimental design

**Population:** adolescent girls at selected schools at Bangalore.

**Sampling technique:** Purposive sampling technique

**Sample size:** 40 Adolescent Girls at selected schools at Bangalore.

**Inclusion criteria for sampling:**

- 1] The samples who are willing to participate in the study.
- 2] The samples who are studying in 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> standard.
- 3] The samples who are available at the time of data collection.
- 4]. The samples who can co-operate in the study.

**Exclusion Criteria for sampling:**

- 1] Who are sensitized to any research study on assertive behavior toward prevention of abuses since 3 months.
- 2] Who are psychologically and physically unhealthy during the time of data collection.
- 3] Who do not co-operate in the study.
- 4] Who have the previous knowledge regarding sexual violence.

**Variables:**

**Independent variables:** Awareness teaching programme regarding sexual violence among adolescent girls.

**Dependent variables:** Behavioral outcomes regarding sexual violence.

**Extraneous variables:** Age, education, religion, type of family, income of the family, sources of information etc.

**Tool:**

**Part A** – It consist of demographic data of participant under study.

**Part B** – It consist of structured knowledge questionnaire regarding sexual violence among adolescent girls from selected schools Bangalore.

**Part C** - It consist of likert scale to assess the attitude level of adolescent girls in selected schools of Bangalore.

**Statistical Technique:**

Required permission from authorities will be taken before study. Then samples will be selected as per inclusion criteria. The analysis of the data is based on the objectives of the study. The data will be analyzed as following:

- 1] The demographic of the subjects will be analyzed using frequency and percentage.
- 2] The pre-test and post-test knowledge and attitude scores will be analyzed using frequency and percentage, Mean, median and standard deviation.
- 3] The effectiveness of awareness teaching program on knowledge and attitude regarding sexual violence at selected aspects will be analyzed using descriptive and inferential statistical methods. Paired't' test and chi square test was used to measure the significant difference between pre-test and post-test scores.

**Results:**

**Section I: Frequency and percentage distribution of adolescent girls according to their selected personal variables.**

The data presented that 18 (45%) were in the age group of 12-14 years, 17 (42.5%) were in the age group 14-16 years, 5 (12.5%) were in the age group of 16-18 years. 13 (32.5%) were studying 8<sup>th</sup> standard, 19 (47.5%) were studying 9<sup>th</sup> standard and 8 (20%) were studying 10<sup>th</sup> standard. Majority 35(87.5%) attained menarche and 5(12.5%) not attained menarche. 26 (65%) of study subjects were belong to Hindu religion, followed by 04 (10%) were Muslims and 10 (25%) were Christians. 28 (70%) belongs to general category, 2 (5%) belongs to SC category, 3 (7.5%) belongs to ST category and 7(17.5%) belongs to OBC category. Majority 24 (60%) were belong to nuclear family and remaining 16 (40%) were belong to joint family. Majority 21 (52.5%) had total 03 family members, followed by 17 (42.5) had 04 family members and remaining 02 (5%) had more than four members. Majority 29 (72.5%) were residing in urban area and 11(27.5%) were residing in rural areas. 5(12.5%) of study subjects were primary education, 6 (15%) of subjects were secondary education, 19 (47.5%) of study subjects were graduates and 10 (25%) of study subjects were post graduates. 3 (7.5%) of study subjects were primary education, 12 (30 %) of subjects were secondary education, 20 (50 %) of study subjects were graduates and 5 (12.5%) of study subjects were post graduates . 1 (2.5%) were laborer, 8 (20%) were self employer, 2 (5%) were government job, 20 (50%) were private job, 9 (22.5%) were contract basis. 7 (17.5%) were laborer, 5 (12.5 %) were self employer, 17 (42.5 %) were private job and 11 (27.5%) were housewife. 17 (42.5%) were having monthly family income Rs 50,001 – 10,000, and 23 (7.5%) were having more than Rs 10,001 monthly income. Majority 34 (85%) of study subjects staying with parents and 6(15%) of study subjects staying with grandparents. 3 (7.5%) of study subjects had zero siblings, 16 (40%) of study subjects had one sibling, 14 (35%) of study subjects had two siblings and 7(17.5%) of study subjects had more than two siblings. 12 (30%) were had few friends, 18 (45%) were had very few friends and 10 (25%) were had many friends. Majority 36(90%) were registered in the society and 4(10%) were not registered in the society. 1(2.5%) were going to the school by walking, 9 (22.5%) were going to the school by local bus, 16 (40%) were going to the school by school bus, 6 (15%) were going to the school by own vehicle and 8 (20%) were going to the school by auto rickshaw. Majority 36(90%) did

not had previous history of sexual violence and 4(10%) had previous history of sexual violence. Majority 32(80%) did not had previous information about sexual violence and 8(20%) had previous information about sexual violence.

### Section II: Frequency and percentage distribution of study subjects according to their level of knowledge.

Level of knowledge	Pre test (Frequency)	Pre test (Percentage)	Post test (Frequency)	Post test (Percentage)
Poor knowledge(<19)	21	52.5	00	00
Average Knowledge (20-30)	16	40	08	20
Good Knowledge(> 30)	03	7.5	32	80

The data presented in the table 1 shows that, majority of them 21(52.5%) had poor knowledge and 16 (40%) had average knowledge and 03 (7.5%) in the pre-test. Data also revealed that in the post test majority, 32 (80%) had good knowledge and 08 (20 %) of them had average good knowledge regarding sexual violence.

### Mean, Median, Range, Standard deviation of pre-test and post-test knowledge score of adolescent girls.

N=40

Test	Mean	Median	Range	SD
Pre test	18.275	18.5	4-40	±6.96
Post test	35.4	35	29-40	±4.38

The data presented in the table 2 shows that, the pre-test knowledge score ranged from 4-40 and the post-test knowledge score ranged from 29-40 and mean pre-test knowledge score is 18.275 with standard deviation of ±6.96 and the mean post-test knowledge score is 35.4 with the standard deviation of ±4.38

### Mean, mean difference, standard deviation difference, standard error and paired 't' test for pretest and post test score of adolescent girls.

n=40

Knowledge score	Mean	Mean difference	SD Difference	Standard Error	Paired 't' test value
Pre test knowledge score	18.275	17.13	2.58	0.41	6.87095
Post test knowledge score	35.4				

**t (39) = 2.02 ; p < 0.05\* significant.**

The data presented in the table 3 shows that the mean difference between knowledge of pre test score and post test score is 17.13. To find the significant difference in mean knowledge scores, paired 't' test was computed and obtained value of paired 't' = 6.87\*, p < 0.05 is found to be significant. Therefore, the null hypothesis is not accepted. Hence it is inferred that, there is significant difference between mean pre-test and mean post-test knowledge scores of adolescent girls regarding sexual violence.

### Section 3: Frequency and percentage distribution of adolescent girls according to their level of Attitude

n=40

Attitude Scores	Pre test (Frequency)	Pre test (Percentage)	Post test (Frequency)	Post test (Percentage)
Favorable attitude (<75)	17	42.5	40	100
Unfavorable attitude (>75))	23	57.5	07	17.5

The data presented in the table 4 shows that, majority of them 23(57.5%) had unfavorable attitude and 17(42.5%) had favorable attitude in the pre-test. Data also revealed that in the post test all 40(100%) were having favorable attitude towards sexual violence.

**Relationship between knowledge and attitude scores of adolescent girls regarding sexual violence.** n =40

Variables	Mean Score	Correlation coefficient (r)
Knowledge	17	0.613*
Attitude	80	

**r (39) = 0.139, p<0.05, \*=Significant.**

The data presented in table 6 shows that, there is significant and positive correlation between knowledge scores and attitude scores of adolescent girls regarding sexual violence. Thus, the research hypothesis was accepted inferring that there is a significant relationship between knowledge and attitude scores of adolescent girls regarding sexual violence. As the knowledge increased attitude also became more favorable and vice versa.

**Discussion:-** Sexual violence has a reflective impact on physical health and mental health. It causing physical injury and it's related to increased risk of a variety of sexual and reproductive health problems of both immediate and long-term consequences. Its impact on mental health than physical health, and may be regularly long lasting. The several research studies support the study findings like Arathi T V (2020) in this article revealed that ongoing teaching and health education can further improve the knowledge of adolescent girls. Vinutha G (2020), an experimental study showed that the knowledge score of the experimental group in pre-test was 41.6%, where it increased to 86.13% during the post-test as an effectiveness of STP (t== 26.72, p<0.05significant). Ongoing teaching and health education can advance get better knowledge of adolescent girls.

**Conclusion:-** Findings of this pilot study showed that implementation of awareness training programme had impact on behavioral outcome regarding sexual violence. The study highlighted the need for creating awareness among adolescent girls because examination is a potential strategy for dissemination of information and their knowledge to other female family members and friends in the society.

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## Effect of communication board on selected parameters of comfort in ventilated clients in selected hospital at Bangalore.

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**BACKGROUND:-**Communication may be defined through verbal or written methods as the communication or exchange of information that is a way to share information in relationships. Mainly via conversation, human people affect others. It's a procedure that contains all the strategies that affect an individual. The first encourages information, ideas and sentiments to be shared between two or more individuals.

**METHODS:-**The study utilized an evaluative technique and the collection of data in a pre-test and post-test group was performed pre-experimental investigation. The study was done among 30 ventilated clients between 05/2/2021 and 19/2/2021; the participants were selected using convenient samples techniques and the data processed and interpreted using descriptive and inferential statistics.

**RESULTS:-**This study demonstrates that the majority (55 percent) of the individuals were male (75 percent) in the 20-30 age range, and female (25 percent) alone. The majority of the subjects (46,70%) were graduates, the majority (23,3%) were housewives, the majority (40%) were Hindus, Most individuals have been incubated in 24-48 hours (60 percent), Most participants (50 percent) have been mechanically ventilated for other reasons and mechanically ventilated with neurological problems alone (13.3 percent), Most individuals (70%) had no mechanical ventilation history before, There were no anxiolytically treated patients. The majority of patients (60%) using the head node as a means of communication were unable to communicate. The total dissatisfaction rate was 66 in previous tests when averaging 34 per cent of mechanically ventilated tests were performed after testing. From above, it is apparent that most (80 percent) exhibited severe frustration in the pre-test whereas Mild to moderate frustration was present in the post-test majority (90 percent).

**CONCLUSION:-**The 't' value 8.191 found is higher than the table, both at the 0.05 importance level. It is therefore found to be less frustrated than what is experienced by the usage of the communication board for the mechanically ventilated clients

### 1. Introduction

Mechanical ventilation is needed when the spontaneous ventilation of the patient is insufficient to preserve life. It is also advised for the imminent fall of other physiological processes or inadequate exchange of gas in the lungs as prophylaxis. As artificial ventilation just helps breathing and does not cure an illness, the underlying condition of the patient should be correctable and resolved over time.

A fan pumps air into and from the lungs mechanically so that patients who cannot sustain their ventilation spontaneously can help or manage their breathing. Common medical instructions include: hypoxaemia, acute lung injury, trauma, respiratory distress, CPD, Hypotension including sepsis, shock, congestive heart failure, muscular neurologically diseased disorders. Hypoxemia, hypotension including sepsis and hypotension are commonly used in medications. Mechanical ventilated patients who have no spontaneous breath, for example people suffering from neuromuscular illness or severe backbone injury, have to be given mechanical fan assistance for > 24 hours. The length of the mechanical ventilator assistance might be long-term or short-term (ICU). The mechanical ventilation ways and

modes also differ. The communication problems in patients undergoing mechanical breathing as their number one concern while incubating have been recorded; Endotracheal intubation involves the mouth or nose delivering an endotracheal tube into the trachea. Inability of the patient to communicate leads to pain, loss of control, decay, anxiety, worry, sadness and frustration. Patients may develop worried because of their capacity to interact orally with their families and health care professionals when their needs are not met during times of mechanical breathing. The healthcare professionals who are having extended ventilation can lessen these stressful circumstances. Patients with mechanical ventilation have a heightened urge to communicate, whereas the endotracheal tube prevents their capacity to speak. The mechanically ventilated patient may be subject to both behavioural and physiological indications. No changes in behavioural or physiological characteristics might result in significant pain. Medical workers, such as various types of plates which can be used to help patients communicate a magic slate board, magnetic plastic letters, an alphabet, a photo board and a photo sample writing board during mechanical ventilation, have proposed the use of a board in order to improve communication. Medical practitioners can readily spot the difficulties by using the many forms of communication boards.

## **2. Objectives of the study**

1. To determine the amount of dissatisfaction of the patient when trying to communicate mechanical breathing
2. To assess the efficacy of the communication board for chosen comfort parameters in mechanically ventilated patients

## **3. HYPOTHESIS**

**H0<sub>1</sub>:** There will be no significant difference between frustration level of mechanically ventilated patients, before and after using of communication board.

**H0<sub>2</sub>:** There will be no association between frustration levels of patients on mechanically ventilated with their selected demographic variables.

**4. Materials and Methods:-** Study employed pre-experimental research preconception with one pre- and post-test group. The investigation was carried out in chosen hospitals in Bangalore. Thirty patients were mechanically ventilated (20-50 years). The sample was selected via comfortable sampling. The official authorization of the pilot and main thesis was acquired. The tool's dependability coefficient was obtained with the use of the Karl Pearson correlation coefficient. The formal information survey reliability was 0.82, which demonstrated the correctness of the procedure. A 1 day pre-test formal pre-test was conducted and, after 3 days, a programmed communication board was followed up with a post-test on the selected parameters of comfort teaching to determine patients' level of frustration with mechanical ventilation, and inferential statistics were used to interpret data.

## **5. Results**

**Demographic variables:-** Distribution among the topics by age showed that the majority of subjects (55%) was male and only female (10%) were male, and the majority (75%) were female and the majority (46,70%) graduated from graduate education, and that only the majority of subjects (6,7%) were male and female and (25%). The bulk of subjects in employment (23.3 percent) were housewives and barely (10 per cent) were farm workers and vendors. The majority (50 percent) was 24-48 hours incubated and just (5 percent) more than 72 hours incubated. The cause for mechanical ventilation was demonstrated by mechanical ventilation of the majority of cases (55 percent) and by neurological issue (13.6 percent alone). Most of respondents (75%) did not have a mechanically ventilated background and only (25%) had a mechanically ventilated past history. Distribution by receiving anxiolytics of mechanical ventilation patients, no anxiolytics received by patients, no communication



was made with the majority (62%) of those using the head node and only (9%) using face-expression as their means of transmission.

**Table 1: Pre test and post test frustration level of mechanically ventilated patients**

Frustration level	Pre test		Post test	
	Frequency	Percent	Frequency	Percent
Mild to moderate frustration	7	23.3	27	90.0
Severe frustration	24	86.7	3	10.0
<b>Total</b>	<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>

The frustration distribution level both pre- and post-test of a majority (86.7 per cent) of patients with mechanically ventilated diseases was seriously frustrated during pre-testing, with a mild to moderate frustration (90 per cent)

**Table 2: Mean, mean percentage and standard deviation for the pre test and post test frustration level of mechanically ventilated patients N=30**

Sl. No.	Frustration level	Max Score	Mean	Mean %	Median	SD
1	Pre test	5	3.2	65	3.5	0.794
2	Post test	5	1.8	35	2	0.651

In previous tests, the average percentage of mechanically ventilated clients was 65, and in the post test, the average percentage was 35.

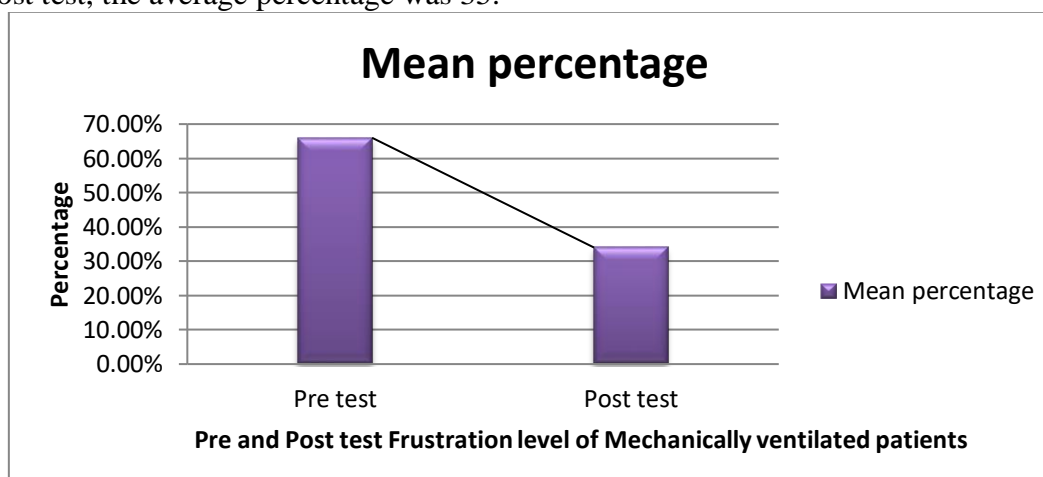


Fig 1: mean percentage of pre and post test Frustration level scores of mechanically ventilated patients.

**Table 3: Comparison of pretest and post test frustration level of mechanically ventilated patients N=30**

Sl. No.	Frustration level	Mean	S D	Mean difference	t Value	Df	Inference
1	Pre test	3.3	0.794	1.60	8.191	29	S
2	Post test	1.7	0.651				

It is obvious from the preceding table that the value 8.191 achieved is higher than the table both in the level of importance (0.01&0.05). It is therefore found to be less frustrated than what is experienced by the usage of the communication board for the mechanically ventilated patient.

**6. Conclusion:-**In this study, the total level of frustration for mechanically ventilated clients was 66 in pre-testing, with an average of 34 percent of mechanically ventilated clients in post-testing. The 't' value 8.191 is obvious, both of which are (0.01&0.05) more important than the table. It is therefore found to be less frustrated than what is experienced by the usage of the communication board for the mechanically ventilated clients.

## Plastic Injection Moulding Process and Its Aspects for Quality

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### ABSTRACT

Because of the competitive climate, industries are under a lot of pressure to create items quickly. As a result, new technologies and manufacturing methods have emerged. Plastic injection moulding is a manufacturing technique for rapidly producing plastic items with minimal errors, but it is a complicated process in terms of product, process parameters, and production set-up, among other things. A little modification in the process environment might have an impact on product quality. Researchers have worked on injection moulding over the past two decades, optimising many elements of the process such as mould design, process parameters, machine setup, product design and form, and so on. This work is being done to determine the most important components of the injection moulding process, as well as the parameters that must be considered throughout production in order to manufacture products with the fewest faults possible.

**KEY WORDS**-Defects, optimization, plastic, process, quality

### INTRODUCTION

Plastics have been the most used engineering material for humans in recent decades. People utilised a lot of plastic goods in their daily lives [1]. Extrusion, Injection moulding, Plastic injection moulding process, Blow moulding, Casting, and other techniques of processing plastics to create plastic components are the most popular. Among these, injection moulding is arguably the most important for local industry – nearly every manufacturing company uses injection moulded components, whether they produce toys, household appliances, electronics or electrical parts, watches, computers, or other products [2].

Plastic items are manufactured in the injection moulding process by pushing resins made of plastic materials into a mould under high pressure, allowing them to cool, harden, and then being removed from the mould by opening the mouth and dragging part of the mould. The plastic injection moulding technique [3] can readily manufacture articles with complex forms and geometries with high dimensional precision. The Clamping Unit, the Injection Unit, and the Drive Unit are the three components of a plastic injection moulding machine. The clamping unit's functions include holding the mould, closing and opening it during the process. The clamping unit consists of fixed and movable plates, tie bars, and the mechanism for opening, shutting, and clamping. The injection unit, also known as the plasticizing unit, melts polymer resins before injecting them into the mould. The plasticizing and clamping units are powered by the driving unit. The preparation of the mould, runner system, gate placement and sprue design, and cooling channel selection and location are the basic requirements for producing an object using the plastic injection moulding method [4].

**The injection moulding procedure may be broken down into four phases.**

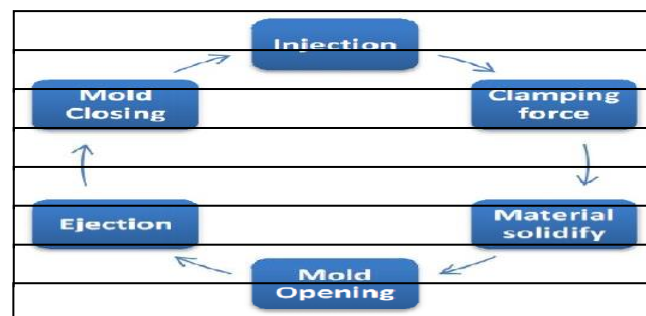
Step 1: The process begins with the selection of the product to be manufactured and the appropriate plastic resin to match the product's qualities, such as tensile strength, compressive strength, stiffness, and so on.

Step 2: Mold, runner, gate, and process parameters are all prepared.

Step 3: Using a needle, inject molten resin into the cavity and let it to harden.

Step 4: Remove the finished product from the mould.

The plastic injection moulding method is used to manufacture high-quality, dimensionally accurate, and dimensionally stable items, although various faults can arise during the process or after it is completed. Shrinkage, warpage, voids, weld lines, and other flaws common in plastic goods include shrinkage, warpage, voids, and weld lines. This, in turn, will have an impact on the industry's reputation. Defects in the goods might arise at any point during the process. Industry experts and researchers have attempted to reduce these flaws by optimising several features such as the mould, the plastic resin, and the process parameters.



**Figure 1: A cycle of plastic injection moulding**

## OBJECTIVES

The purpose of this study is to review previous research on the plastic injection moulding process and to offer a platform for researchers to conduct future research. For this aim, the literature evaluation is divided into four phases that are completed during the manufacturing process. The table below will detail the step with the label "Task" and probable explanations for faults in that phase that the researchers are focusing on.

**Table 1: Steps, Work, and Defect Causes**

S. No.	Step	Work	Reason of Defects
1	1	Selection of the product and selection of suitable of plastic resin	<ul style="list-style-type: none"> <li>• Product attributes-thickness, corners, undercuts etc.</li> <li>• Resin Attributes- Viscosity, surface tension, density, thermal conductivity etc.</li> </ul>
2	2	Selection of mold, runner, gate and process parameters	<ul style="list-style-type: none"> <li>•• Mold material, thermal conductivity of mold, Runner type (cold/hot), shape, size Gate cross-section, location and</li> <li>• Process parameters</li> </ul>
3	3	Injecting the melt resin	<ul style="list-style-type: none"> <li>•• Resin properties, Process parameters,</li> <li>• Machine Specifications</li> </ul>
4	4	Taking out the final product	<ul style="list-style-type: none"> <li>• Cooling Channel type, location, shape</li> </ul>

## REVIEW OF LITERATURE

**For plastic injection moulding, the placement of the gate should be optimised. Journal of Injection Molding Technology, edited by Y.C. Lam and S. Jin.**

Gating design is one of the most critical factors to consider when designing a mould for plastic injection moulding. Gating design has always relied significantly on the mould designer's expertise and experience. To address this issue, a number of automated gating design systems have been created. While design limitations are crucial in real-world applications, they are not taken into account by most of the aforementioned automated gating design methods. Furthermore, these systems still need a significant amount of work and experience in both CAD and CAE processes, especially when design limitations are taken

into account. An automated method is created in this study to address design limitations in automated gating synthesis, taking advantage of both CAD and CAE system capability. During the gate optimization process, the standard deviation of filling time is used as the objective function, and a hill-climbing search method is applied. So far, no-gate restrictions for three-plate moulded parts and edge-gate constraints for two-plate moulded parts have been studied. These restrictions are established utilising the capabilities of a CAD system in an integrated CAD/CAE design environment for plastic injection moulding, and then translated into CAE features.

**Two flow analysis software for injection moulding tool design are compared. i.h. sahputra**

The primary goal of this article is to compare the findings of an injection moulding process simulation analysis provided by a specific programme to those acquired in a small-scale industrial process. The samples were made in the laboratory using a 'Dasset' injection moulding machine. Rhinoceros Computer Aided Design (CAD) software was used to model the component. Moldflow plastics insight was used to conduct a simulation study (MPI). To test the software's accuracy, two distinct gate locations were chosen for simulation. For testing and manufacturing, polyethylene (PE) and high impact polystyrene (HIPS) were used. When compared to samples, MPI accurately predicted the maximum pressure required to fill the mould cavity. The flow route and weld lines predicted by MPI were graphically comparable to the machine's process. Such information is not available in SIMPOL. Due to an issue with the equipment, it was not feasible to compare the results. MPI also produced a simulation analysis report for the injection moulding process in addition to these results.

**Saman, A.M., Abdullah, A.H., and Nor, M.A.M. discuss the use of computer simulation in the creation of plastic injection moulds for automobile parts.**

When designing a plastic injection mould, the designer's objective is to create a mould that uses the least amount of material and takes the least amount of time each cycle while producing a product that is free of flaws and blemishes. The designer can change the mould design by changing the form of the component, as well as the placement of the runner and gate. As a result of the high cost of mould production, trial-and-error experimentation in mould design is not cost effective. The usage of a CAD/CAE programme aided in the design and establishment of the most optimum mould gating system to solve this challenge. Using CATIA and MOLDFLOW software, this study was carried out by applying the usage of CAD/CAE tools to develop an ideal mould gating design. The programme greatly aids the designer in determining the optimal gating location for a mould in order to produce an automobile plastic component with minimal faults, a short time-cycle, and, most importantly, lower manufacturing costs.

**S.R. Pattnaik, D.B. Karunakar, and P.K. Jha published a journal paper titled "Application of computer simulation for determining optimum gate placement in plastic injection moulding process."**

Plastic industries are developing at the quickest rate due to high demand for plastic items. This contribution discusses the use of CA software in the moulding process. Injection moulding is a difficult procedure that relies heavily on input data for precision. The first section of this article explains the injection moulding process and its simulation when a genuine item is loaded. Then, to obtain the requisite stiffness of the selected component, design and technological adjustments were performed. The article's main focus is on moldflow plastics simulation in AMA software, with sections of simulations discussed. When compared to traditional trial-and-error procedures on the factory floor, simulation verification takes significantly less time to obtain a quality result and has no material expenses.

**David O. Kazmer and Russell G. Speight's Polymer Injection Molding Technology for the Next Millennium**

The introduction of the first thermoplastic materials, the reciprocating screw design, the first hot runner systems, engineering materials, the introduction of microprocessors for machine control, Computer Aided Engineering flow simulation software, and, most recently, the application of expert systems for optimised machining are all major milestones in injection moulding technology. This article provides a vision of injection moulding for the future century that addresses current industrial demands, followed by a description of the advancements required to make that vision a reality. The next millennium's injection moulding machine will bring the entire injection moulding storey together in one big picture, combining existing fragmented ideas of machine, material, process, and production information control with Computer Aided Design techniques to produce a fully optimised manufacturing strategy. In this paradigm, machine setup procedures will be automated as a matter of course, with each machine in a production facility having consistent setup/optimization methods and injection moulding being phased out. Setters for injection moulding will refocus their efforts on more complicated moulding challenges that have evaded the design process, giving them a clear path to improve product quality. The ultimate goal is to create a machine that generates no scrap material and improves product quality while requiring less worker expertise, using less energy, and requiring little maintenance.

**Wei Guo, Lin Hua, Huajie Mao, and Zhenghua Meng used experimental design to predict warpage in plastic injection moulding.**

Based on design of trials, a mathematical model for predicting warpage in injection processing parameters was developed. (DOE). The five most important factors were first tested using fractional factorial design (FFD): melt temperature, coolant temperature, injection time, V/P switchover, and mould temperature. Second, the predictive mathematical model was built utilising central composite design (CCD) of tests and FE simulation, taking into account the other four main processing factors except the melt temperature. Finally, the statistical analysis findings were gathered using the Moldflow programme. The findings showed that the mathematical approach might be used to accurately forecast warpage. As a result, utilising this predictive mathematical model, corrective and iterative design procedures may be begun and performed for higher product quality without resorting to physical testing in plastics injection mould.

**Table 2: Literature Review Summary**

<b>Problem</b>	<b>Problem associated to</b>	<b>Step No.</b>
Comparison of injection molding technologies	Product geometry	Step-1
Shrinkages and warpage	Product Thickness	Step-1
Design and fabrication of cooling channel and submarine gate	Cooling channel and Gate	Step- 2 & 4
Performance evaluation of design of cooling system	Cooling channel	Step-3 & 4
Effects of geometry and parameters on weld line	Product geometry and Process parameters	Step-1 & 2
Analysis of polyvinyl alcohol–starch	Plastic Resin and Process parameters	Step-1 & 3
Effect of cooling on warpage at the corners	Product geometry	Step-1
Effect of viscosity, shear rate	Plastic resin behaviour	Step-1
Effect of cooling system on the shrinkage	Cooling channel	Step-3 & 4
Effect of cooling system	Cooling channel, Process	Step-3 &

	parameters	4
Determination of Process parameters for thin-shell plastic parts	Product geometry and Process parameters	Step-1 & 3
Analysis of fibre composite window frame	Product geometry, Process parameters and cooling channel	Step-1, 3 & 4
Effects of parameters on Ultra-thin wall plastic parts	Process parameters and Product geometry	Step-1 & 3
Surface profile of optic lens	Plastic resin properties and product geometry	Step-1 & 2
Evaluation of filling conditions	Process parameters	Step-3
Determination of parameters	Process parameters and Machine set up	Step-3

## RESULT AND DISCUSSION

Based on a study of the literature, we can deduce that the majority of studies have focused on process parameters and product shape. It is simple to control flaws by choosing the right shape and settings. Process parameters may be changed at any point throughout the process, but other elements such as mould design and material have cost and time constraints, although the use of a cooling channel can enhance product quality while increasing cycle time and cost. Although the plastic injection moulding process is complicated, by regulating the process environment, the product may be produced with fewer errors. Process parameters have an essential influence in the process, according to a literature study. Other post-process variables, such as mold/product form, size, and geometry, as well as machine set-up, were not as critical as process parameters. Plastic industries are developing at the quickest rate due to high demand for plastic items. Plastic injection moulding starts with the creation of moulds and the production of complicated forms. Controlling the quality of injection moulded goods relies heavily on the proper setup of injection moulding process factors. Controlling attribute flaws such as sink marks is quite essential. Sink marks are essentially a "built-in" problem that must be addressed from the design stage. Due to specific restrictions and circumstances, it is occasionally overlooked during the design stage and expected to be handled by moulders with simply the directive to 'do their best.' Controlling faults by managing a large number of processing variables is a huge undertaking that takes a lot of time, effort, and money. Mould Flow Analysis is a sophisticated modelling tool for minimising sink marks and predicting the needed production time at the lowest cost. When compared to traditional trial-and-error procedures on the factory floor, simulation verification takes significantly less time and has no material expenses to get a quality output. In this thesis, sink marks in the production of a head lamp for an Alto Car plastic component were minimised by comparing alternative process settings and single gate, two gate, and three gate positions. When material is filled in the mould, blow holes, sink marks, and weld lines must be avoided in order for light to pass through clearly. Modeling is completed in Pro/Engineer, and Mould Flow Analysis is completed in Pro/Plastic Engineer's Advisor.

## CONCLUSION

Due to space constraints, just a few references are provided that demonstrate the researchers' areas of interest. The ability to optimise this procedure in terms of material component is restricted owing to the material's reliance on the product's use. It is simple to optimise the process by selecting and adjusting the relevant process parameters.

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# EFFICACY OF ALTERNATIVE THERAPY ON BEHAVIOURAL OUTCOMES REGARDING MANAGEMENT OF MINOR AND MAJOR DISORDERS IN PREGNANCY AMONG PRIMIGRAVIDA MOTHERS FROM SELECTED GOVERNMENT HOSPITALS OF CHITRADURGA

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**ABSTRACT:** **Aim:-**Efficacy of alternative therapy on behavioural outcomes regarding management of minor and major disorders in pregnancy among primi gravida mothers from selected government hospitals of Chitradurga Karnataka. **Method:** Quantitative research design was adopted for this study. The study sampling technique used was purposive sampling technique. Data was collected from 40 primigravida mothers' women aged 18-30 years. After a thorough review of literature related to topic the tool was developed. Reliability of the tool was done by answering the questionnaire, teaching programme, pre-test and post-test was given alternative therapy. **Result:** the pre-test knowledge score is inadequate knowledge 36 (90%) Moderate knowledge 4 (10%) Adequate knowledge 0 (0%) and post-test inadequate knowledge 5 (12.5%) Moderate knowledge 31 (77.5%) Adequate knowledge 4 (10%) and pre-test attitude level is unfavorable attitude 40(100%) Moderately and favourable attitude 0(0%) post-test attitude level is unfavourable attitude 20(50%) Moderately favourable attitude 20 (50%) favourable attitude 0(0%) **Conclusion:** The study shows that deficient knowledge regarding alternative therapy of minor and major disorders of pregnancy, among primi-gravida women. The teaching was found the effective in the knowledge of the primi-gravida mothers. It was concluded that there was need to plan and implement educational programs by the nurses for all the antenatal mothers, particularly primigravida women regarding alternative therapy of minor and major disorders in pregnancy

**Keywords:-** Efficacy, Behavioural outcome, Primi-gravida, Alternative therapy, Minor disorder, Major disorders.

## 1.INTRODUCTION

“Healthy Mothers and children are the real wealth of Societies.” (WHO)

Women, when pregnant for the time are very excited about the event. They have the feeling of attaining complete womanhood. Pregnancy is a happy event. There is joy, Celebration,



time of congratulations, good wishes and gifts. The woman is made to feel very important and everyone provides her with undivided attention. She feels special and content. During this period, the woman is over protected. She is treated like queen with all care. As days go by, she undergoes many physiological changes. She will sometimes be able to adjust to it and sometimes not. Pregnancy is creative and productive period in the life of a woman. It is one of the vital events, which needs special care from conception to postnatal period. Every mother wants to enjoy nine months period with the baby inside her; the experience of pregnancy is not always joyful. Pregnancy is a kind of miracle. Especially is in that a man and woman can aspire to force god to create a new soul. **-Robert Anton Wilson.**

The news of pregnancy excites a woman: she plans everything for arrival of the new baby with a lot of care and happiness. She plans to eat healthy and also alert her lifestyle to suit her baby best. The wait to bring a new life surfacing out of our own body is the one that all of us aspire to experience at least once in our life time. This period is called pregnancy. Pregnancy is not a disease but it is true to say that a pregnant woman does not feel as normal as when not pregnant: there are some pregnancy related complaints which, when excessive need to be treated most of the common minor ailment can be treated. Giving life is powerful. It is vital. Therefore, we prepare our body to become a suitable environment for the baby to grow in while staying happy n healthy emotionally and mentally as well. Each week of pregnancy brings with its new changes and feeling that may require some explanation and support. The anatomical physiological and biochemical adaptations to pregnancy are profound. These changes that the female body undergo during pregnancy begin soon after fertilization and continue through gestation. These changes occur in response to physiological stimuli provided by the foetus and placenta. Minor ailments are common during pregnancy and non-pharmacological therapies should be considered as the first line treatment, if appropriate. However, medication may be required to ensure the well-being of the mother and prevent secondary major adverse effects to the foetus. Those hormonal change lead to minor discomforts in all the women's body systems like nausea, vomiting, constipation, excessive urination and fatigue. These minor discomforts are the signs that the body is naturally preparing itself for new life(Thomas, 2010): Traditional or alternative medicine practices are the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health. The term alternative therapy means any forms of medicine that is outside the mainstream of western medicine or conventional medicine. The tern is loosely

used to cover all forms of medicine except allopathy. Alternative medicines exist in all cultures to some degrees and terms such as traditional medicine, indigenous medicine or folk medicine are used to describe such practices. Several alternative therapies are available for treating minor and major disorders in pregnancy namely Acupressure, Aromatherapy, Hydrotherapy and ayurvedic measures including Yoga and Meditation. Even with complications, early detection and prenatal care can reduce any further risk to you and your baby. Some of the most common complications of pregnancy include high blood pressure, gestational diabetes, preeclampsia preterm labor, a loss of pregnancy, or miscarriage, depression.

## **2.REVIEW OF LITERATURE**

A literature review is an evaluative report of information found in the literature related to selected area of the study. The review describes, summarizes, evaluates and clarifies this literature. It gives a theoretical base for the research and helps to determine the nature of research.

**According to (Polit and Hungler 1999)**, a review of connected literature is an essential step of research project. It broadens the understanding associated facilities to realize a insight necessary for the event of a broad abstract context into which the problem statement fits.

A literature review is an account of what has been already established or published on a particular research topic accredited scholars and researcher. **University of Toronto, 2001**

**Hamad K.J, (2019)** in his article titled, knowledge of minor discomforts during pregnancy among pregnant women. the study result shows significant associations were found between pregnant mothers' knowledge and their reproductive variables of gravida, abortion, and type of pregnancy. The findings of the present study there was inadequate knowledge of discomforts during pregnancy among participants. The study results revealed that women knowledge level was significantly associated with age, educational level, occupation, gravida, abortion, and type of pregnancy.

**Pooja Nadholta, et al., (2020)** in their article titled, potential benefits of Yoga in pregnancy-related complications during the COVID-19 pandemic and implications for working women. The study suggests pregnancy-related complications are becoming more prevalent because of a sedentary lifestyle, restricted physical activity and growing stress. In such situations, a home or workplace Yoga protocol can combine both exercise and mindfulness-based

alleviation of anxiety for both working and non-working women. yoga can be effective for combating stress and anxiety besides boosting immunity in pregnant working women confronted with the COVID-19 pandemic.

### **3. OBJECTIVES OF THE STUDY:**

1] To assess the pre-existing knowledge level regarding alternative therapies for managing selected minor and major disorders in pregnancy among primi gravida mothers before the intervention.

2] To find out the pre-existing attitude level regarding alternative therapies for managing minor and major disorders in pregnancy among primi gravida mothers before the intervention.

3] To implement awareness program on alternative therapies regarding minor and major disorders in pregnancy among primi gravida mothers.

4] To evaluate the effectiveness awareness program on alternative therapy for managing minor disorders in pregnancy among primi gravida mothers after the intervention.

5] To compare the post-test scores with the pre-test scores on knowledge and attitude level among primi gravida women regarding management of minor disorders by using alternative therapies.

6] To evaluate association of alternative therapy regarding management of minor and major disorders of pregnancy with their selected socio-demographic variable of primi gravida mothers.

**4. MATERIAL AND METHODS:-**The current study was pre-experimental one group pre-test post-test design was adopted in the present study to accomplish the objectives. Purposive sampling technique was used to select the samples. The sample consisted of 40 primi-gravida women aged between 18-35 years. The pre-test assessment of knowledge of the prim-gravida women was carried out using a structured knowledge questionnaire followed by planned teaching programme session regarding Alternative therapy. After seven days post-test was conducted using the same structured knowledge questionnaire. The collected data was analysed by using descriptive and inferential statistics.

**Alternative therapy programme:** Structured awareness programme was prepared to by reviewing research and non-research articles, consulting experts in the area was included in the awareness programme.

## 5. RESULTS

**Table – 1: Mean, Median and SD of pre-test and post-test knowledge scores of primi gravida mothers on alternative therapy**

**N=40**

Sl. No.	Knowledge aspects	No. of Items	Max Score	Pre test			Post test		
				Mean	Mean %	SD	Mean	Mean %	SD
1	Minor disorder	10	10	4.08	40.8	1.403	5.72	57.2	1.536
2	Major disorder	10	10	4.08	40.8	0.971	5.4	54.0	1.411
3	Alternative therapy	8	8	1.88	23.5	1.09	5.05	63.12	1.339
4	Acupressure	7	7	2.82	40.28	0.781	3.68	52.57	1.185
5	Aromatherapy	4	4	1.65	41.25	0.893	2.28	57.0	0.877
6	Hydrotherapy	8	8	2.6	32.5	0.955	5.18	64.75	1.466
7	Yoga	9	9	2.9	32.22	1.63	5.92	65.77	2.129
8	Meditation	4	4	1.6	40.0	0.672	2.85	71.25	0.893
<b>Overall</b>		60	60	21.6	36.0	4.584	36.08	60.13	5.526

From the above table it is evident that the mean pre-test knowledge scores of primi gravida mothers on alternative therapy on minor and major disorders during pregnancy was 36.0% with standard deviation 4.584 and post-test knowledge scores of primi gravida mothers on alternative therapy on minor and major disorders during pregnancy was 60.13% with standard deviation 5.52.

**Table – 3: Knowledge level of primi gravida mothers on alternative therapy in pre and post-test**

**N=40**

Overall Knowledge level	Pre test		Post test	
	Frequency	Percent	Frequency	Percent
a. Inadequate knowledge	36	90.0	5	12.5
b. Moderate knowledge	4	10.0	31	77.5
c. Adequate knowledge	0	0.0	4	10.0
<b>Total</b>	<b>40</b>	<b>100</b>	<b>40</b>	<b>100</b>

Above table shows majority (90%) of primi gravida mothers had inadequate knowledge in pre-test, were as (77%) of primi gravida mothers improved to moderate knowledge in post-test on alternative therapy on minor and major disorders during pregnancy.

**Table – 3: Attitude level of primi gravida mothers on alternative therapy in pre and post-test** N=40

Overall Knowledge level	Pre test		Post test	
	Frequency	Percent	Frequency	Percent
a. Unfavorable attitude	40	100.0	20	50.0
b. Moderately favorable attitude	0	0.0	20	50.0
c. Favorable attitude	0	0.0	0	0.0
Total	40	100	40	100

Above table shows (100%) of primi gravida mothers had Unfavourable attitude in pre-test, were as (50%) of primi gravida mothers improved to moderately favorable attitude in post-test on alternative therapy on minor and major disorders during pregnancy

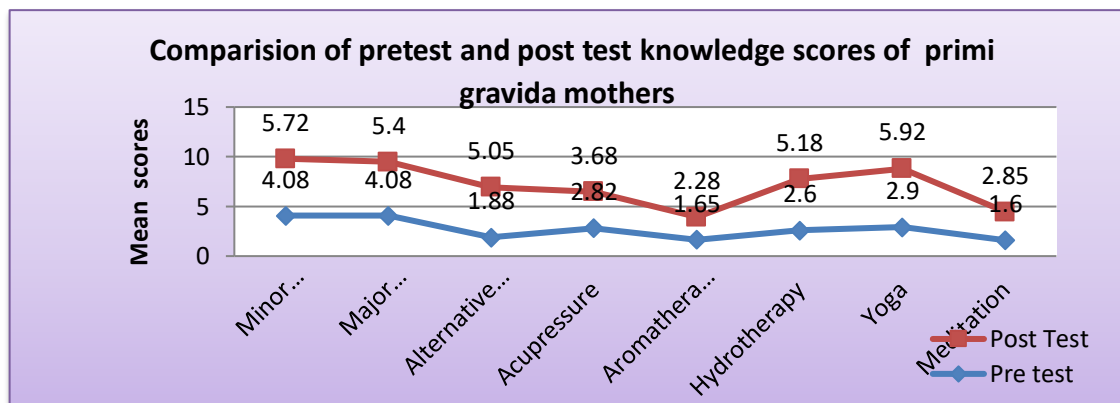
**Table – 4: Comparison of pre-test and post-test knowledge scores of primi gravida mothers on alternative therapy** N=40

Sl. No.	Knowledge aspects	Pre test		Post test		Mean difference	t Value	df	Inference
		Mean	SD	Mean	SD				
1.	Minor disorder	4.08	1.40	5.72	1.53	1.65	7.622	39	S
2.	Major disorder	4.08	0.97	5.4	1.41	1.32	8.002	39	S
3.	Alternative therapy	1.88	1.09	5.05	1.33	3.175	11.008	39	S

4.	<b>Acupressure</b>	2.82	0.78	3.68	1.18	0.85	4.367	39	S
5.	<b>Aromatherapy</b>	1.65	0.89	2.28	0.87	0.62	5.106	39	S
6.	<b>Hydrotherapy</b>	2.6	0.95	5.18	1.46	2.57	8.793	39	S
7.	<b>Yoga</b>	2.9	1.63	5.92	2.12	3.03	8.691	39	S
8.	<b>Meditation</b>	1.6	0.67	2.85	0.89	1.25	7.017	39	S
	<b>Overall</b>	21.6	4.58	36.08	5.52	14.47	16.422	39	S

The difference in post test scores with pre-test scores of knowledge's regarding alternative therapy among primi gravida mothers was statistically significant indication that the intervention has improved their knowledge.

**Graph – 1: Comparison of pre-test and post-test attitude scores of primi gravida mothers on alternative therapy** N=40



**6. DISCUSSION:-**Alternative therapies on management of minor and major disorders in pregnancy. pre-test mean 4.08% and standard deviation 1.40 was found, and post-test mean 5.72 and standard deviation 1.53, major disorder, pre-test mean score 4.08% and standard deviation 0.97 and post-test mean score 5.4 and standard deviation 1.41, Alternative therapy pre-test mean score 1.88 and standard deviation 1.09 and post-test mean score 5.05 standard deviation 1.33. Acupressure pre-test mean score 2.82 and standard deviation 0.78, post-test mean score 3.68, standard deviation 1.18, Aromatherapy pre-test mean score 1.65 and standard deviation 0.89, and post-test mean score 2.28, and standard deviation 0.87. Hydrotherapy pre-test mean 2.6, and standard deviation 0.95, post-test mean score 5.18, and standard deviation 1.46. Yoga pre-test mean score 2.9, and standard deviation 1.63, post-test mean 5.92 and standard deviation 2.12. Meditation, pre-test mean score 1.6 and standard deviation 0.67, post-test mean score 2.85, and standard deviation 0.89. The overall mean % of Primi gravida mothers on use of alternative therapies on management of minor and major

disorders in pregnancy pre-test mean score 21.6 and standard deviation 4.58, and post-test mean score 36.08, standard deviation 5.52.

Computed 't' value 16.4 is greater than the table value table value for one tailed  $t_{59}=1.96$ ,  $p<0.05$ ), which represents the significant gain of knowledge through awareness programme. Hence the research hypothesis H1 was accepted. Thus, it suggests that the awareness teaching programme has been effective in increasing the knowledge of nursing personnel at Government hospital. Chitradurga.

**7. CONCLUSION:-**Efficacy of alternative therapy on behavioural outcome regarding minor and major disorders to the pregnant mothers is less to those who are primi gravid and primi para, low socio – economic status, low educational level. Hence there is a role for lifestyle modification i.e., education, occupation and economic status.

**8. RECOMMENDATION:-**On the basis of the findings of the study, the following recommendations had been made for the further study: -

- 1] Study can be replicated on a large sample to validate the findings and make generalized.
- 2] A comparative study can be conducted among the rural and urban pregnant women.
- 3] A similar study can be done by using other research design.

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First and foremost, I thank and praise THE ALMIGHTY GOD for giving all the wisdom, knowledge, strength and guidance to complete this study successfully.

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**10. CONCLUSION:-**The obtained "t" value 16.4 is greater than the table value at 0.05 level of significance. Therefore, "t" value is found to be significant. It means there is gain in knowledge level of primi gravida mothers. This supports that efficacy of alternative therapy on management of minor and major disorders in pregnancy are effective in increasing the knowledge level primi gravida mothers. The obtained "t" value 16.4 is greater than the table

value at 0.05 level of significance. Therefore, "t" value is found to be significant. It means there is improvement in attitude level of primi gravida mothers. This supports that efficacy of alternative therapy on management of minor and major disorders in pregnancy are effective in improvement in attitude level primi gravida mothers.

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## AN APPROACH ON DYNAMICS AND ECONOMY OF GROUNDWATER RESOURCES IN HARYANA

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**ABSTRACT:-**Water is the major limiting factor for crop production in semi-arid and arid regions of the world. Due to low and uncertain annual rainfall in these regions the crop water requirement is mainly supplied by supplemental irrigation. Groundwater is the most preferred source of water in various user sectors in India on account of its near universal availability, dependability and low capital cost. The increasing dependence on ground water as a reliable source of water has resulted in indiscriminate extraction in various parts of the country without due regard to the recharging capacities of aquifers and other environmental factors. The irrigation sector remains the major consumer of ground water, accounting for 92% of its annual withdrawal. The development of ground water in the country is highly uneven and shows considerable variations from place to place. The over exploitation of groundwater resources has resulted in extra power consumption, ecological degradation and the sustainability of agricultural production. This paper, therefore, attempts to analyze the problem of declining water table, factors for its depletion and suitable mitigation measures to combat the declining water table problem for sustainable agriculture development in the state. The major mitigation strategies include crop diversification, delay in paddy transplantation, laser leveling, zero tillage technology, bio drainage, and rainwater harvesting for artificial groundwater recharge in the aquifers. The highly uneven distribution and its utilization make it impossible to have single management strategy for the country as a whole. Any strategy for scientific management of ground water resources should involve a combination of supply side and demand side measures depending on the regional setting.

**Key words:-** Groundwater, Sustainable Agriculture, Irrigation, Green Revolution

**INTRODUCTION:-**Water is the major limiting factor for crop production in semi-arid and arid regions of the world. Water resources play a vital role in healthy economic growth of a country but their utilization needs to be scientifically planned and managed keeping in view the future demands which are inevitably to increase manifold for domestic, irrigation and industrial purposes. Ground water has made significant contributions to the growth of India's Economy and has been an important catalyst for its socio economic development. Its importance as a precious natural resource in the Indian context can be gauged from the fact that more than 85 percent of India's rural domestic water requirements, 50 percent of its urban water requirements and more than 50 percent of its Ground water has made significant contributions to the growth of India's Economy and has been an important catalyst for its socio economic development. Its importance as a precious natural resource in the Indian context can be gauged from the fact that more than 85 percent of India's rural domestic water requirements, 50 percent of its urban water requirements and more than 50 percent of its irrigation requirements are being met from ground water resources. The increasing dependence on ground water as a reliable source of water has resulted in its large-scale and often indiscriminate development in various parts of the country, without due regard to the recharging capacities of aquifers and other environmental factors. In order to address various issues related to ground water, keeping in view the climatic change, there is a need to prepare a comprehensive road map with identified strategies for scientific and sustainable management of the available ground water resources in the country so as to avert the looming water crisis. In addition to addressing the issues of declining water level, the strategies should also focus on the imbalances in ground water development in the country, reasons thereof and

suggesting measures including accelerated development of ground water in areas with low stage of ground water development.

**GROUND WATER RESOURCES ESTIMATION METHODOLOGY:-**The ground water resources assessment for 2008-09 were carried out based on the guidelines of Ministry of Water Resources which broadly follows the methodology recommended by Ground Water Resources Estimation Committee, 1997. However, there have been few modifications in the MOWR guidelines namely in the criteria of Categorization of Assessment units and future Allocation for irrigation and domestic & industrial sector. Ground water resources are estimated assessment unit wise. The assessment unit is watershed in the states occupied predominantly with hard rocks. This is because the ground water balance equations recommended in GEC-1997 can be better applied in the assessment units with hydrologic/hydrogeological boundaries. However, in the states covered predominantly with alluvium and/ or soft rocks, administrative blocks are chosen as assessment unit since in alluvial areas it is difficult to identify watershed considering the possibility of trans-boundary aquifer system.

**Assessment of ground water draft:-**Ground water draft is estimated seasonally. The most commonly used method for computation of irrigation draft is – number of abstraction structures multiplied by the unit seasonal draft. Alternative methods like area irrigated by ground water and the associated crop water requirements are also recommended for assessment of ground water draft for irrigation. Ground water draft for Domestic & Industrial needs is computed using unit draft method and based on consumptive use pattern of the population. Assessment of ground water recharge from other sources Ground water recharge due to return flow from irrigation, seepage from canals, recharge from tanks and ponds and recharge from water conservation structures are to be estimated separately for both monsoon and non-monsoon seasons based on the recommended norms. Assessment of ground water recharge from rainfall Ground water recharge from rainfall is estimated for monsoon and nonmonsoon seasons separately. Rainfall recharge during monsoon season is estimated using two methods – Water level fluctuation Method and Rainfall Infiltration Factor Method.

**Ground Water Resources Availability:-**Rainfall is the major source of ground water recharge in India, which is supplemented by other sources such as recharge from canals, irrigated fields and surface water bodies. A major part of the ground water withdrawal takes place from the upper unconfined aquifers, which are also the active recharge zones and holds the replenish able ground water resource. The replenish able ground water resource in the active recharge zone in the country has been assessed by Central Ground Water Board jointly with the concerned State Government authorities.

Ground water extraction for various uses and evapotranspiration from shallow water table areas constitute the major components of ground water draft. In general, the irrigation sector remains the main consumer of ground water. The ground water draft for the country as a whole has been estimated as 231 bcm (Central Ground Water Board, 2006), about 92 percent of which is utilized for irrigation and the remaining 8 percent for domestic and industrial uses. Hence, the stage of ground water development, computed as the ratio of ground water draft to total replenishable resource, works out as about 58 percent for the country as a whole. However, the development of ground water in the country is highly uneven and shows considerable variations from place to place.

Table - Haryana: Groundwater Resources and Their Utilizations (2019)

Districts	Net Annual Groundwater Availability	Existing Gross Groundwater Draft for Irrigation	Existing Gross Groundwater Draft for Domestic and Industrial Water Supply	Existing Gross Groundwater Draft for all Uses	Provision for Domestic and Industrial Requirement Supply to 2025	Net Groundwater Availability for Future Irrigation Development	Stage of Groundwater Development(%)	Overall Category of District
Ambala	52244	41583	7710	49293	9040	1621	94	Overexploited
Panchkula	13876	9072	2790	11862	4379	425	85	Critical
Fatehabad	60605	107316	1403	108719	1810	-48521	179	Overexploited
Bhiwani	55138	43068	756	43824	925	11145	79	Safe
Hisar	66249	59836	449	60285	572	5841	91	Critical
Gurgaon	23261	35777	18150	53927	18150	-30666	232	Overexploited
Mewat	21623	13280	1173	14453	1830	6513	67	Safe
Faridabad	20228	14118	2232	16350	2746	3364	81	Critical
Palwal	44771	45892	999	46891	1134	-2255	105	Overexploited
Jhajjar	42718	40751	192	40943	230	1731	96	Critical
Jind	81714	77363	3510	80873	4278	73	99	Critical
Kaithal	50783	101504	6242	107746	6242	-56963	212	Overexploited
Karnal	85905	118899	1244	120143	1244	-34238	140	Overexploited
Kurukshetra	34323	67904	6737	74641	6737	-40318	217	Overexploited
Mahend	2143	224	388	22841	505	-	10	Over

ergarh	7	53				152 1	7	exploit ed
Paniapt	3086 5	509 61	495	51545	495	- 205 91	16 7	Over exploit ed
Rewari	2799 9	312 55	116	31371	131	- 338 7	11 2	Over exploit ed
Rohtak	4501 7	284 46	2297	30743	2662	139 09	68	Safe
Sirsa	7545 2	115 634	776	11641 0	789	- 409 71	15 4	Over exploit ed
Sonipat	7742 6	906 22	3913	94535	4168	- 173 64	12 2	Over exploit ed
Yamuna nagar	4819 9	550 77	10215	65292	1047 1	- 173 49	13 5	Over exploit ed
Total	9798 33	117 081 1	71787	12425 98	7853 8	- 269 516	12 7	Over exploit ed

### Reasons for Declining Trend of Water Table

The present groundwater scenario in Haryana can be attributed to the following reasons:

Change in Cropping Pattern After the inception of green revolution in Haryana farmers shifted from low water consuming crops to high water requiring crops such as paddy crop irrespective of soil conditions and rainfall quantity. There has been a phenomenal rise in area under paddy from 3000 km<sup>2</sup> in 1975-76 to 12000 km<sup>2</sup> in 2011-2018. The irrigation water requirement of this increased paddy crop are fulfilled by groundwater. Lack of Proper Planning of Systematic Groundwater Extraction Apart from above, groundwater extraction in the state is on the rise to meet the increased population demand in industrial and domestic sector as well. Moreover, property based rights provoke the people towards unregulated abstraction.

**Table - Crop Diversification (Option: Replacement of Rice With)**

Crop	Area (km <sup>2</sup> )	Irrigation Water Demand (Rice = 73 cm) with Alternative (cm)	Water Saved (Mm <sup>3</sup> )
Maize	2,500	60	325
Groundnut	500	50	115
Soybean	500	60	65
Pulses	500	45	150

**Table - Irrigation Efficiencies of Various Irrigation Techniques (percent)**

Irrigation Efficiencies	Methods of Irrigation		
	Surface	Sprinkler	Drip
Conveyance efficiencies	40-50 (Canal); 60-70 (	100	100

	well)		
Application efficiencies	60-70	70-80	90
Surface water moisture evaporation	30-40	30-40	20-25
Overall efficiency	30-35	50-60	80-90

**Replacement of Long Duration Rice Varieties:-**Long duration varieties of rice resulted in an increased crop water requirement in the state of Haryana. Therefore, emphasis needs to be given on development of short duration rice varieties and superior quality basmati, having lesser water requirements.

**Table - Water Use Efficiency of Crops under Different Irrigation Systems (q/ha/cm)**

Crops	Flood Irrigation	Sprinkler Irrigation	Drip Irrigation
Wheat	0.93	1.79	-
Bajra	0.39	1.07	-
Jowar	0.19	0.59	-
Sorghum (kharif)	2.45	4.58	-
Maize (kharif)	1.22	2.01	-
Barley	1.35	3.59	-
Gram	0.37	1.27	-
Oilseeds	0.14	0.31	-
Groundnut (kharif)	0.26	0.47	-
Sunflower (rabi)	0.53	0.96	-
Chillies	0.48	0.89	1.46
Garlic	0.83	1.23	-
Onion	4.29	7.94	2.03
Cotton	0.17	0.24	0.61
Sugarcane	3.23	4.61	21.27
Papaya	0.57	-	3.13
Ash gourd	1.29	-	1.63
Tomato	1.24	-	8.29
Lady's finger	1.87	-	13.15
Brinjal	3.11	-	6.67
Sweet potato	0.67	-	2.37
Radish	0.23	-	1.10
Beet	0.07	-	0.50
Potato	11.79	-	17.21
Watermelon	3.68	-	11.03
Bottle gourd	4.53	-	7.54

### **Water Saving Under Paddy Crop**

Paddy in Haryana is sown in an area of about 12340 km<sup>2</sup>. Proper scheduling of irrigation (amount and timing) to crops is an important component of water saving technologies. Intermittent irrigation in paddy i.e. 15 days ponding followed by 2 days of drying can result in 25% saving of water. Also, shifting the date of transplanting of paddy from first week of May to third week of June checks the water table decline by 70 cm without any adverse effect on the yield. Likewise, direct seeded rice requires 23% less irrigation water as compared to traditional transplanted rice.

### **Adoption of Modern Irrigation Techniques**

Micro irrigation systems (sprinkler and drip) have the potential to increase irrigation water use efficiency. The usages of these systems can double the irrigated area without constructing any new irrigation projects, reduce energy requirement (electricity), weed problems, soil erosion and cost of cultivation. Water use efficiency of micro irrigation systems in relation to conventional irrigation systems (flood and gravity) have been demonstrated with reference to different crops (Table 6). The efficacy of water use is substantially higher under sprinkler and drip irrigation techniques in comparison to flood and gravity irrigation techniques, mainly because of reduction in convenience and distribution losses. Moreover, application of drip irrigation technique on farms saved water without any yield reduction.

**Management of Ground Water Resources:** Management of ground water resources in the Indian context is an extremely complex proposition as it deals with the interactions between the human society and the physical environment. The highly uneven distribution of ground water availability and its utilization indicates that no single management strategy can be adopted for the country as a whole. On the other hand, each situation demands a solution which takes into account the geomorphic set-up, climatic, hydrologic and hydrogeologic settings, ground water availability, water utilization pattern for various sectors and the socio-economic set-up of the region.

A) Supply Side Measures As already mentioned, these measures are aimed at increasing the ground water availability, taking the environmental, social and economic factors into consideration. These are also known as ‘structural measures’, which involves scientific development and augmentation of ground water resource. Development of additional ground water resources through suitable means and augmentation of the ground water resources through artificial recharge and rainwater harvesting fall under this category.

(i) Scientific Development of Ground Water Resources

- a) Ground Water Development in Alluvial Plains:
- b) Ground Water Development in Coastal Areas:
- c) Ground Water Development in Hard Rock Area
- d) Ground Water Development in Water-logged Areas
- e) Development of Flood Plain Aquifers

(ii) Rainwater Harvesting and Artificial Recharge

B) Demand Side Measures Apart from scientific development of available resources, proper ground water resources management requires to focus attention on the judicious utilization of the resources for ensuring their long-term sustainability. Ownership of ground water, need-based allocation pricing of resources, involvement of stake holders in various aspects of planning, execution and monitoring of projects and effective implementation of regulatory

measures wherever necessary are the important considerations with regard to demand side ground water management.

**Development from Deep Aquifers:-** The stage of ground water development is rather high in the States of Haryana, Punjab and Rajasthan and a large number of over-exploited and critical assessment units fall in these states. Studies by CGWB in the Indo-Gangetic basin in Punjab, Haryana, Uttar Pradesh, Bihar and West Bengal have revealed the existence of deep-seated aquifers storing voluminous quantity of ground water. Fresh ground water has been reported down to a depth of about 700 m in Uttar Pradesh. Exploratory studies carried out by ONGC in the Gangetic alluvium indicated existence of fresh ground water at more than 1000 m depth. Similarly, free flow of ground water due to artesian conditions exists in some areas like Tarai and sub-Tarai belt of Uttar Pradesh and Bihar. As no energy is required for extraction of ground water from such aquifers, development of ground water from these auto-flow zones is both economically viable and eco-friendly.

Issues Related to Ground Water Development:

The various issues emerged during Ground Water Development in West Bengal are:

1. Chronically water scarce area in western part and in hilly tract in the northern part of the State.
2. The area where depletion in water level has been ascertained.
3. Hazards due to mining activity in Coal mine area and
4. Area falling under Geogenic contamination: High arsenic, High fluoride, High salinity and High iron

#### **AREA FALLING UNDER GEOGENIC CONTAMINATION:**

**High arsenic in ground water:-** Arsenic contamination in ground water occurs in isolated patches in spreading over 79 blocks in eight districts namely, Malda, Murshidabad, Nadia, North 24 Parganas, South 24- Parganas to the east and Haora, Hoogly and Bardhaman to the west of Bhagirathi/ Hoogly river. Eastern part of Bhagirathi/ Hoogly river is much more affected than the western part. Deeper aquifers (> 100 mbgl) in the same area are generally free from arsenic. Ground water in arsenic affected area is characterized by high iron, calcium, magnesium, bicarbonate with low chloride, sulphate and fluoride.

**High fluoride in ground water:-** The Task Force on Fluoride Contamination had recommended rapid assessment of fluoride concentration in ground water in 105 blocks of 12 districts of West Bengal. After the assessment, the final scenario regarding the high fluoride concentration in ground water of West Bengal has been observed in 43 blocks of 7 districts, namely Bankura, Birbhum, Purulia, Malda, Uttar Dinajpur, Dakshin Dinajpur and South 24 Parganas. However this problem is most serious in Bankura, Birbhum, Purulia and Dakshin Dinajpur districts. CGWB has found fluoride contamination above the permissible limit in Nadia and Bardhaman district as well. In the state highest concentration of fluoride in groundwater has been reported from Khyarasol block (15.9mg/lit) and Rampurhat-I block (17.9mg/lit) of Birbhum district.

**High salinity:-** Based on the geophysical surveys and ground water exploration, Brackish to saline and fresh water bearing aquifers have been deciphered in the different depth zones in Kolkata Municipal Corporation area, South 24 Parganas and in parts of North 24 Parganas, Haora and Purba Medinipur districts.

**High iron in ground water:-** Iron content in some isolated patches of Medinipur, Haora, Hugli and Bankura iron content is somewhat higher than 1 ppm and sometimes it exists more than 2 ppm in Haora and parts of Hugli districts. Likewise, in the Himalayan foothills in the districts of Darjeeling and Jalpaiguri ground water in near surface aquifers have iron as high as more than 3 ppm at places.

**CONCLUSIONS:-**Groundwater accounts for almost half of the irrigation requirement of Haryana and have contributed significantly in the agricultural development. There is clear evidence that groundwater is being overexploited, yet about 20000 of additional tube wells are being installed every year. In the rain fed areas of the south-west, farmers are pumping groundwater from depth of about 50 m and its depletion is now a fact in all districts of state. Therefore, to achieve a sustainable utilization of groundwater resources, a balanced development and management mechanisms is urgently required involving users, planners and policy makers at all levels (participatory approach). The highly diversified hydrogeologic settings and variations in the availability of ground water resources from one part of the country to other call for a holistic approach in evolving suitable management strategies. A multitude of mechanisms have been developed or have emerged in these areas to enable farmers to benefit from ground water. Assured power supply is one of the key factors, the tariff, access and availability of which to a large extent determines the ground water use. Since the ground water development is mostly demand driven, it can be geared up through proper agricultural, credits, subsidy and energy support policies along with creation of suitable markets. The main source of ground water resources is recharge through rainfall which contributes to about 68% of the total annual replenishable resources. The annual replenishable ground water resources of the country as a whole do not indicate any appreciable change from previous assessments. There is urgent an need for coordinated efforts from various Central and State Government agencies, non-Governmental and social service organizations, academic institutions and the stakeholders for evolving and implementing suitable ground water management strategies in the country.

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## DEVELOPMENT AND SYNTHESIS OF SILVER NANO PARTICLES USING DIFFERENT TESTING CONDITIONS

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**ABSTRACT:-**Recent advances in nanoscience and nanotechnology radically changed the way we diagnose, treat, and prevent various diseases in all aspects of human life. Silver nanoparticles (AgNPs) are one of the most vital and fascinating nanomaterials among several metallic nanoparticles that are involved in biomedical applications. This review presents the main methods of chemical reduction for the preparation of silver nanoparticles, such as the preparation of silver particles using  $\text{NaBH}_4$  and ascorbic acid as a reducing and stabilizing agent, the preparation of silver particles using PVP as a reducing agent and the preparation of silver particles using DMF as a reducing agent. Moreover, this work makes a brief review of nanoparticles' contribution to water treatment and the development of "environmentally-friendly" nanofertilizers, nanopesticides, and nanoherbicides, as well as presenting the harmful effects of nanoparticles accumulation in plants and soils. Interactions of nanomaterials with environmental microorganisms are inevitable, but the general consequences of such interactions remain unclear, due to a lack of standard methods for assessing such interactions. Therefore, this paper describes the relevant reported green synthesis of silver nanoparticles from plant extracts and their capacity as antimicrobial agents within the agricultural field for fighting against bacterial and fungal pathogens that can cause plant, waterborne, and foodborne diseases.

**Keywords:-**Green synthesis; nanobiotechnology; nanoparticles; silver; sustainable development

**INTRODUCTION:-**Nanoscience and nanotechnology have now become the topic research that many developed. Nanoparticle materials are developed in many applications because of their unique optical characteristic. As a visual element providing broad applications in chemistry, medical, biology and material science. Nanoparticles can be broadly classified into two groups: Organic nanoparticles and Inorganic nanoparticles. Organic nanoparticle are carbon nanoparticle (fullerenes) and inorganic nanoparticles are magnetic nanoparticle, noble nanoparticle (gold and silver), semiconductor nanoparticle (titanium oxide and zinc oxide). Especially inorganic nanoparticles have created attention towards itself due to its superior material properties with versatile functions. Due to nano size feature it easily used for chemical imaging drugs agents and drug. Its versatile function used for the cellular delivery as they are widely available, rich functionality, good biocompatibility.

Silver nanoparticles (AgNPs) are increasingly used in various fields, including medical, food, health care, consumer, and industrial purposes, due to their unique physical and chemical properties. These include optical, electrical, and thermal, high electrical conductivity, and biological properties. Due to their peculiar properties, they have been used for several applications, including as antibacterial agents, in industrial, household, and healthcare-related products, in consumer products, medical device coatings, optical sensors, and cosmetics, in the pharmaceutical industry, the food industry, in diagnostics, orthopedics, drug delivery, as anticancer agents, and have ultimately enhanced the tumor-killing effects of anticancer drugs.

### LITERATURE REVIEW:

**Henry F. Aritonang et al (2019)** In the present study, we synthesized silver (Ag) nanoparticles using aqueous extracts of fresh leaves of *Impatiens balsamina* and *Lantana*

camara medicinal plants as bioreducing agents. This method allowed the synthesis of nanoparticles, which was confirmed by ultraviolet-visible (UV-Vis) spectrophotometry and transmission electron microscopy (TEM). UV-Vis spectra and visual observation showed that the color of the fresh leaf extracts of *L. camara* and *I. balsamina* turned into grayish brown and brownish yellow, respectively, after treatment with Ag precursors.

**Luis Castillo-Henríquez et al (2020)** Nanobiotechnology, combined with green chemistry, has great potential for the development of novel and necessary products that benefit human health, environment, and industries. Green chemistry has an important role due to its contribution to unconventional synthesis methods of gold and silver nanoparticles from plant extracts, which have exhibited antimicrobial potential, among other outstanding properties.

**Siavash Irvani et al (2017)** the development of efficient green chemistry methods for synthesis of metal nanoparticles has become a major focus of researchers. They have investigated in order to find an eco-friendly technique for production of well-characterized nanoparticles. One of the most considered methods is production of metal nanoparticles using organisms. Among these organisms plants seem to be the best candidates and they are suitable for large-scale biosynthesis of nanoparticles. Nanoparticles produced by plants are more stable and the rate of synthesis is faster than in the case of microorganisms. Moreover, the nanoparticles are more various in shape and size in comparison with those produced by other organisms.

**Dehkordi et al (2019)** AgNPs have not been shown to cause bacterial resistance currently complicating antibiotic therapy of bacterial infections. This is presumably due to the fact that, unlike antibiotics, AgNPs do not exert their antibacterial effects in a single specific site but at several levels such as bacterial wall, protein synthesis and DNA (i.e. attack a broad range of targets in the organisms), which means that, microorganisms would have to develop a number of mutations simultaneously to protect themselves.

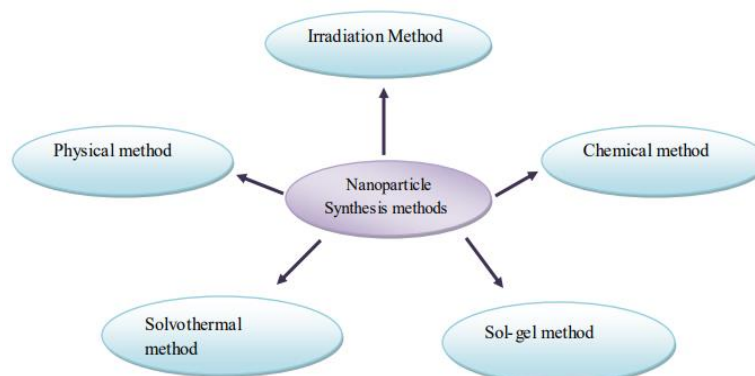
**Marignier et al (2018)** The formation of AuNPs can be attributed to the radiolytic reduction which generally involves radiolysis of aqueous solutions that provides an efficient method to reduce metal ions. In the radiolytic method, when aqueous solutions are exposed to gamma rays, they create solvated electrons, which reduce the metal ions and the metal atoms eventually coalesce to form aggregates.

#### **Silver Ions vs Silver Nanoparticles:**

1. The antimicrobial properties of silver nanoparticles (Ag NPs) are less understood
2. Possible bactericidal mechanisms for Ag NPs include
  - a) Cell uptake followed by disruption of both ATP production and DNA replication
  - b) Cell membrane damage
  - c) Generation of reactive oxygen species

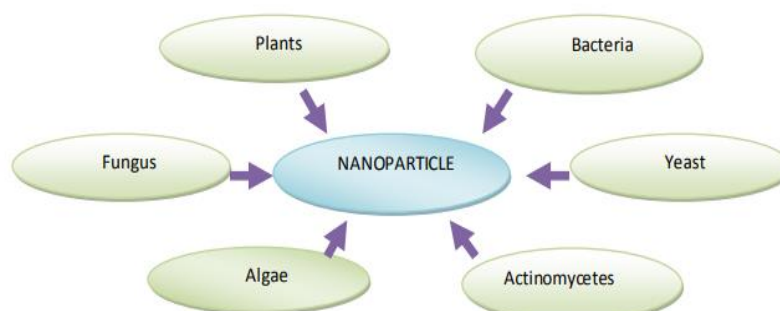
**Chemical approach:**-Chemical method is the most commonly used method for the synthesis of silver nanoparticles. The most commonly used reducing agents are sodium borohydride, hydrazine hydrate, potassium auro chlorate and sodium citrate. The reduction of various complexes with Ag<sup>+</sup> ions leads to the formation of silver atoms (Ag<sup>0</sup>), which is followed by agglomeration into oligomeric clusters. These clusters eventually lead to the formation of colloidal Ag particles.

Solvothermal synthesis is a flexible low temperature route in which polar solvents under pressure and at temperatures above their boiling points are used. The reaction of the reagents under the solvothermal conditions increases significantly and enabling the reaction to take place at lower temperature.



**Fig: Different methods of nanoparticle synthesis.**

**Biosynthesis of nanoparticles:-** Although chemical & physical methods are very successful to produce well- defined nanoparticles, they have certain limitations such as increase cost of production, release of hazardous by-products, long time for synthesis and difficulty in purification. Biosynthesis of nanoparticles as the name indicates help in the synthesis of very complex reaction within a fraction of minutes have now taken up the attention towards synthesis grievance the need of environmentally benign technologies in material science. Nature has some processed device to synthesis of nano and micro sized materials which contribute to the development of relatively new and unexplored area of research based on the biosynthesis of nanomaterials.



**Fig: Different routes for biosynthesis of nanoparticles.**

**Properties of AgNPs:-** Physical and chemical properties of AgNPs—including surface chemistry, size, size distribution, shape, particle morphology, particle composition, coating/capping, agglomeration, dissolution rate, particle reactivity in solution, efficiency of ion release, cell type, and finally type of reducing agents used for synthesis—are crucial factors for determination of cytotoxicity. AgNP surface charges could determine the toxicity effect in cells. For instance, the positive surface charge of these NPs renders them more suitable, allowing them to stay for a long time in blood stream compared to negatively-charged NPs, which is a major route for the administration of anticancer agents.

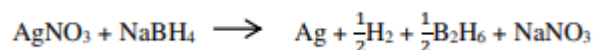
**Scanning Electron Microscope:-** Scanning electron microscope (SEM) analysis the employed to characterization of size, shape & morphologies of formed nanoparticle SEM gives high-resolution images of the surface of a sample is desired. The scanning electron microscope works as same principle as an optical microscope, but it measures the electrons scattered from the sample rather than photon.

**X-Ray Diffraction:-** XRD is a technique to used go study phase composition of a sample, crystal structure, texture or orientation. The principle of XRD is that the X-rays are passed through a material and the pattern produced give information of size and shape of the unit cell. The atoms are crystal in structure arranged in a periodic array and thus can diffracted

light at different angle. When Xray passing through a crystal it produces a diffraction pattern, that diffraction gives the information about the atomic arrangement within the crystals. In silver nanoparticle XRD gives phase structure and purity of the particle.

### Result and Discussion:

**Effect of AgNO<sub>3</sub> Concentration:**-The synthesis of Silver nanoparticle carried out by chemical reduction method. Silver nitrate are a source of Ag<sup>+</sup> and NaBH<sub>4</sub> as reducing agents that produce AgNP, the chemical reaction is the sodium borohydride reduction of silver nitrate.



The formation of Silver nanoparticle by chemical reactions is carried out by adding reactants sequentially, namely AgNO<sub>3</sub> compound drop by drop into NaBH<sub>4</sub> solution. The addition of reactants in reverse order causes the formed Silver nanoparticle to settle immediately (Song et al., 2009). The results of AgNP synthesis produce different color solutions, such as : pale yellow, golden yellow and brownish yellow shown in Fig. UV-visible spectroscopy is one of the popular characterization techniques to determine particle formation and its properties (Desai et al., 2012). At low AgNO<sub>3</sub> concentration a weak absorption maximum of surface plasmon peaks was observed at 406 nm, with increasing the AgNO<sub>3</sub> concentration the intensity of the maximum plasmon peak increased and silver nanoparticles were formed.

Tabel 1 show the size distribution of nanoparticles with different AgNO<sub>3</sub> concentration, the colloidal of Silver nanoparticle was prepared by 0.5 mM AgNO<sub>3</sub> gave 71.02 nm, 1.5 mM AgNO<sub>3</sub> gave 67.08 nm and 1.0 mM AgNO<sub>3</sub> gave a smallest size (34.06 nm). Therefore, molar ratio 2:1 (NaBH<sub>4</sub> : AgNO<sub>3</sub>) that gave the smallest size was selected as the optimized ratio.

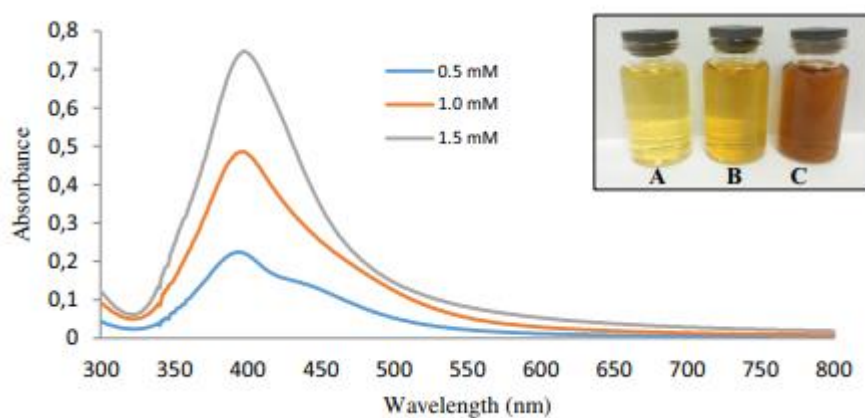


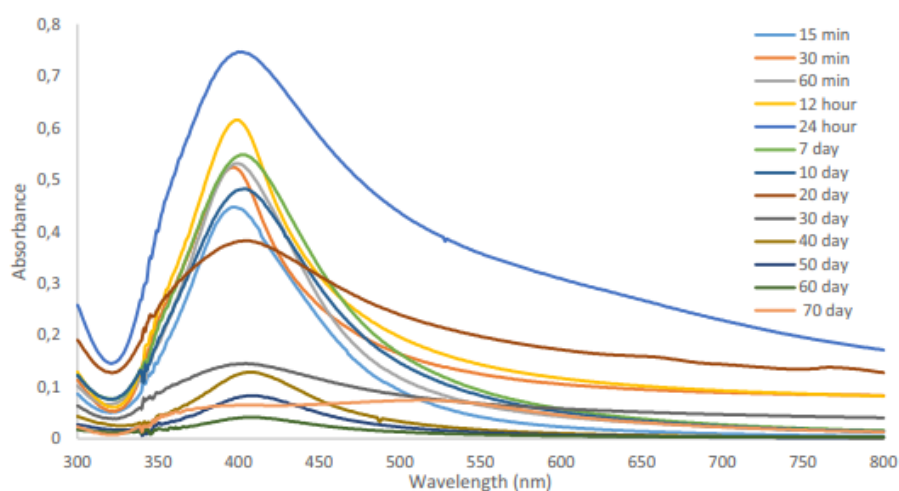
Figure: UV-Vis spectrophotometer of Silver nanoparticle with variation AgNO<sub>3</sub>, inset: corresponding visual color (A) AgNO<sub>3</sub> 0,5 mM, (B) AgNO<sub>3</sub> 1,0 mM dan (C) AgNO<sub>3</sub> 1,5 mM.

**Table. result of effect of AgNO<sub>3</sub> concentration**

[AgNO <sub>3</sub> ] (mM)	$\lambda_{\text{maks}}$ (nm)	Absorbance	Size distribution (nm)
0.5	406	0.315	71.02
1	399	0.345	34.06
2	397	0.729	67.08

**The stability of silver nanoparticles:**In general, the synthesis of metal nanoparticles is chemically carried out in the presence of precursor metals, reducing agents and stabilizers. The mechanism of metal reduction into metal nano consists of two stages, namely the nucleation and growth stage. Nucleation requires activation of energy greater than energy at

the growth stage. This study observes the process through time parameters, so that it can be seen the stability of the formed silver nanoparticle.



**Figure. UV-Vis spectrophotometer of the stability of silver nanoparticles**  
**Table. The stability of silver nanoparticles**

Stability	$\lambda_{\text{maks}}$ (nm)	Absorbance	Size distribution (nm)
15 min	397	0,0447	45,17
30 min	397	0,524	41,47
60 min	398	0,531	40,22
12 hour	399	0,615	34,15
24 hour	400	0,747	36,74
7 day	402	0,548	49,05
10 day	403	0,482	50,46
20 day	404	0,382	63,12
30 day	405	0,145	68,51
40 day	407	0,128	79,77
50 day	408	0,083	91,80
60 day	409	0,041	136,1
70 day	409	0,065	162,7

**CONCLUSION:-**This review comprehensively addressed synthesis, characterization, and bio-applications of silver nanoparticles, with special emphasis on anticancer activity and its mechanisms and also therapeutic approaches for using AgNPs. The size, shape, in general the morphology of the nanoparticles dependent on the specific control of factors such as reaction kinetics, temperature, pH, etc., so that the synthesis method is selective in obtaining the nanoparticle what is sought to be synthesized. The possible mechanism of the bactericidal action of the AgNP is that the formation of reactive oxygen species occurs which deteriorates the microbes, DNA and proteins and the cell membrane causing death.

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## Cardiovascular Health Risk Behavior among Youths: A Review.

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**Introduction:**-Cardiovascular disease (CVD) is now days considered one of the leading cause of death and disability across the world. The World Health Organization (WHO) also enlisted cardiovascular disease as one the main causes for mortality and morbidity across the globe. In the year 2008, WHO estimated that about 17.3 million people died as a result of CVD. Out of these numbered deaths, more than 80% deaths happened in developing countries. According to the recent report of WHO, an estimated 17.9 million people died from CVD in 2019, of these 85% were due to hear attack and stroke. It was also estimated by the WHO that with the closure of 2020, this ratio of CVD will be 32%. (WHO-[www.who.int](http://www.who.int)) To talk about India, which is a developing country, CVD is a primary killer in the country- accounting 28% deaths of all annually. The author's purpose in giving these death figures is not to create fear among the youth, but to describe the facts related to cardiovascular disease. According to the study of Lancer Globe Health (2018), there has been a continuous growth of CVD in India since last three decades having major mortality rate among the youngsters of India. Cardiovascular disease is a group of diseases that affect the heart or blood vessels. However, the term refers to any disease that affects the heart vessels. Generally, it is used for diseases related to sclerosis or arterial disease. CVDs are those diseases that affect cardiovascular health related symptoms to heart, kidney, arterial, and brain. Series of diseases related to hear and blood vessels are also treated as heart diseases which include different health related problems. Cardiovascular functioning not only affects the changing age group of human life but also function with psychological, physiological, and morphological changes within human life. (Balhara-2015) All these humanly related factors further contribute for high risk of getting CVD normal, healthy and asymptomatic person. The symptoms that we generally receive from the CVD are related to hardening conditions of blood cells or inside the walls of arteries which gradually narrows the space in the arteries. In fact, blood clot can stop blood flow either partial or completely. Consequently, without any blood cells and blood flow, heart lacks oxygen, which many times results as heart attack or stroke. Clinically, when there is a large chest pain, it is called angina condition of a person. Many times, angina is caused due to inability of atherosclerotic arteries of the heart that maintains oxygen balance.

Following are some diseases that fall under the category of CVD.

1. Coronary Heart Disease.
2. Rheumatic Heart Disease.
3. Stroke.
4. Congenital Heart Disease.
5. Thrombosis in vein.
6. Pulmonary Embolisms.

According to the study of Balhara-2015, family history is a major cause for increasing CVD risk among the family members. Particularly, family member having age of 60 or 60 plus. CVD have a tendency to spread and grow among the family members like parents, brothers,

sisters and fore fathers as they have genetic material of similar constituents. According to the study of Snowden and his colleagues-1982, almost 30% of deaths occurred from CHD and CVD had strong family history with them. Studies of Manson-1994 and others revealed that risk among male is more alarming than female to develop cardiovascular disease at an early age. Considering the above facts of cardiovascular disease as well as risk factors and findings of Manson (1994) and others studies that male gender at an early age has high risk of CVD, it is noteworthy to observe the studies that have been conducted on youths and risk CVD risk factors.

### **Objectives of the Study:**

1. To understand risk factors related to cardiovascular disease.
2. To study the risk factor behavior among the youths.
3. To review studies based on CVD, especially on youths.
4. To reveal facts from reviewed studies.

**Methodology:-**The aim of this study is to investigate the cardiovascular health risk behavior among the youths, the researcher followed review method. Studies conducted on CVD with reference to youth's health behavior risks were reviewed. Total 6 studies have been reviewed, being conducted from 2006 to 2020. Finding of the study are related to the facts received from the studies earlier conducted.

**Diet Practice:-**Fatty diet practice was a common thing for college going students. Study of Natrajan and his colleagues having sample of 232 observed that 39.6% students having age group less than 30 had fatty diet practices while, 28.3% students having age group over 30 had fatty diet practice. Among the, female students observed higher fatty diet practice 42.4%. Asadi, Habib and Name (2006), in their study having 554 female sampling observed 49% female students having practice of fatty diet, while 21% girls having practice of healthy diet. Rustangi, Taneja, Mishra and Ingale (2011) observed 12% students out of 336 as regular and healthy diet within first four semesters of their learning and in seventh semester they observed decrease in good diet habits.

**Smoking/ Tobacco/ Alcohol Practice:-**Of Natrajan and his colleagues' study 15.9% out of 232 student participant in the study observed to have tobacco addict. 20.8% students were regular tobacco chewers, 19.8% male students used to smoke cigarette. Female students in their study observed fewer responses as they had almost no addicts. Asadi and colleagues' observed only 3% women students having addict of tobacco and alcohol, While, in Rustangi's study taking alcohol among the students of colleges in North India increased after the first semester. Boys' ratio of alcohol was higher than girls having 33.5%, while girls 21.20%. Only 7% male students were smokers on irregular basis. Ramkrishna, G. S., Sankara Sharma, and Thankappan, K. R. (2005) observed tobacco addict among the students of Orissa.

**Physical Exercises:-**atrajan's study observed good physical exercise habits among the students as only 19.5% students were physically inactive. Among these 19.5% inactive students, 42.9% were female students. Asadi's study revealed that 42% female were regular exercisers i.e. by cycling, swimming, gym exercises. 66 female students (12%) used to perform physical exercises for 150 minutes per day. While another 9% female students used to perform physical exercise for more than 3 hours. Rustangi and his colleagues' study indicate that decrease in physical inactive observed since first semester of students and was continued up to seventh semester. It ended with 58% students' inactiveness in physical activities. Sedentary activities of students increased after semesters. Study of Brando,

Pimpelal, Silva (2008) observed low physical activities among the university students (22%-65%). Irvin, J. D (2007) also observed inactive physical activity participation among university students. Healey G.M. and his colleagues (2008) observed reduce risk factors of CVD among individual due to continuous energy activities and physical activities.

### **Findings of the study:**

1. All reviewed studies in the present study provide cardiovascular health behaviour practices of students learning at university and academic colleges in India.
2. Both male female students had irregular diet habits among them as almost 28.9% of them used to take tea rather than eating food at lunch and dinner time. Most of student who had fatty diet habits prevent fruits in their diet system.
3. Female as compare to male observed conscious towards their diet habits. But observed following junk food during recess hours of their academics.
4. Unhealthy diet is the biggest contributor to ischemic heart disease. Almost 54% of all student respondents from the reviewed studies were not meeting healthy dietary requirement.
5. Chewing tobacco observed to be regular practice among the college students in the studies. Male rather than female observed having habit of tobacco. Taking alcohol thrice in a week was the common practice of male students from all supportive data.
6. North Indian boys' students as compare to South Indian boys were regular smokers. Female students having 29% were either habits of alcohol, tobacco, and smoking practices.
7. Health related activities and practices were uncommon for the students.
8. Almost 38% students of all study participants were doing exercises like cycling, gym, swimming, running, and push-up and jump activities.
9. 37% female were regular exercisers.
10. Increase in inactive occurred after increase in semester. 37% among all 1543 students were inactive in accordance to semester. Out of 37% inactive students, 56% percent were female students.

**Conclusion:-**From the above findings and discussion, it can be concluded that almost all parts of Indian states, students are not meeting the healthy diet practice, which directly affect health risk for CVD. Though the prevalence of smoking and chewing tobacco among the student participants in previous studies is declined or reduced, but both male female students in the country are continue addicts. Modern westernization and imitation to modern societies and lack of awareness are the causes of declined health awareness and increased addicts among the students. Modifiable cardiovascular risk behavior is widely prevalent among the college students in Indian even in medical college students also. Promotion of supportive environment for strengthening student-based approaches strategies for health education and awareness is essential to them. Preventing oneself from chronic stress is essential for any kind of heart attack.

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## **Effectiveness of inserting Chilled Nasogastric tube on Level of comfort of Patients admitted in a Selected Hospital at Mangalore**

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**Abstract:**-Comfort Care is a nursing art that entails the process of comforting actions performed by a nurse for a patient. Nasogastric intubation is the placement of a tube into the stomach through the nose. It is very important for nurses to understand about discomfort of the patient. The aim of the study to determine the effectiveness of inserting chilled nasogastric tube on the level of comfort of the patients. A true experimental design- Posttest only control group design was used for the study. The samples were randomly allocated into two groups by lot method into experimental (20) and control group (20). Investigator used an interview schedule to elicit the demographic proforma, level of comfort was assessed in both the groups by observational checklist, rating scale by self-report and numerical pain rating scale. Control group undergone routine nasogastric tube insertion and the experimental group undergone chilled nasogastric tube insertion. The finding showed that all the subjects 40 (100%) of the subjects experienced high level of comfort in the experimental group. The study revealed that there was a significant difference in the level of comfort of patients according to the mean pain scores in the experimental group (1.90).

**Keywords:**-Nasogastric Tube, Comfort, Chilled

**Introduction:**-Comfort a single seven-letter word which denotes a positive outcome of care. Insertion of a nasogastric tube into the stomach is a common medical intervention indicated for a wide range of patient situations. While doing this procedure in the clinical area it has been observed that patient experience a great discomfort. It is observed that the most difficult phase for patient requiring nasogastric tube is during insertion. Patient faces a difficulty in accepting this treatment modality and adapt to it.<sup>6</sup> It is very important for nurses to understand about what discomfort is? Nurses are the health personnel who are most closely caring and observing the patients.<sup>36</sup>

**Need for the Study:**-Nasogastric intubation is the placement of a tube into the stomach through the nose.<sup>2</sup> The procedure is uncomfortable and sometimes unsuccessful. Cooling has vasoconstrictor action and reduces the sensation of pain. Chilling makes the Nasogastric tube stiffer and is easy to insert and gives cooling sensation. Temperature of a chilled Nasogastric tube should be 14<sup>0</sup> C to 16<sup>0</sup>. Despite the ease and appropriateness of this procedure, especially for conscious and alert patients' cooperation is required. It is considered to be an uncomfortable and painful procedure.<sup>4,13</sup> A study conducted in 1999 and NGT placement was rated by both patients and practitioners as the most painful procedure encountered in the emergency department. The use of Chilled Nasogastric tube causes cooling and stimulates thermal receptors instead of noci-receptors hence somatic sensation of coolness will occur to patient instead of pain.<sup>5</sup> Keeping in view the above finding in literature, Nasogastric tube insertion is believed to be the most painful of routinely performed procedure. The investigator in her personal experience realized that many patients experience discomfort during nasogastric tube insertion. After an extensive review of literature regarding discomfort during nasogastric tube insertion and by the personal experience in the field, the investigator concluded that chilled nasogastric tube insertion may be an effective measure to increase the level of comfort of patients during nasogastric tube insertion. So, she decided and motivated to take up this study.

### **Objectives of the study**

1. To assess the level of comfort of patients while inserting Nasogastric tube in the experimental group and control group.

2. To determine the effectiveness of chilled nasogastric tube on level of comfort by comparing in the experimental and control group
3. To find the association between level of comfort of patient in the experimental and control group with selected demographic variables such as age, gender, occupation, education

**Research Methodology:-**A True experimental design- Post-test Only Control Group design was adopted for the study. The subjects are randomly assigned either to the experimental or the comparison/ or control group.

#### **Data Collection Instrument**

The instruments used for this study are:

- Baseline proforma.
- Observational checklist on level of comfort.
- Rating scale on level of comfort by self-report of the patient.
- Numerical pain rating scale.

#### **Tool 1: Base line Proforma**

It consists of 10 items for obtaining information.

#### **Tool 2: Observational Checklist on level of comfort**

The tool consists of 17 items covering three areas which include the following:

1. Physical response
2. Physiological response
3. Procedural

#### **Tool 3: Rating scale on level of comfort by self-report of the patient**

It is a 4-point Likert scale with options 'strongly agree', 'agree', 'disagree', and 'strongly disagree' was developed by the investigator to assess the level of comfort of the patients by self-report.

#### **Tool 4: Numerical Pain Rating Scale**

It is a standardized tool which is developed with 0-10 scale, with '0' meaning 'No pain' and '10' meaning 'worst possible' pain.

The content validity index of the tool was 1. The reliability of the behavioral observational checklist and rating scale was assessed by inter-rater reliability method and correlation was computed by using Spearman Rank Correlation Coefficient and was found to be (0.86) and 0.87 respectively.

**Data Collection Process:-**The study was conducted by using purposive sampling technique and selected 40 patients between the age group of 20-60 years, indicated for nasogastric tube insertion. The subjects were then randomly assigned by lottery method to the experimental and control group with 20 in each group, who fulfilled the inclusion criteria. The patients were asked to give the baseline information. The experimental group undergone chilled nasogastric tube insertion along with xylocaine jelly and the control group undergone normal (routine) nasogastric tube insertions along with xylocaine jelly and both groups were given proper explanation of the nasogastric tube insertion. The nasogastric tube insertion procedures were undertaken by the same nurse for both the groups. The level of comfort was observed by the investigator during the nasogastric tube insertion using behavior observational checklist on level of comfort. Rating scale on level of comfort by self-report of the patient was rated soon after the procedure. Their pain intensity was measured by using Numerical pain Rating Scale. The investigator observed that experimental group subjects experienced more comfort during chilled nasogastric tube insertion.

#### **Data Analysis**

The data analysis was planned on the basis of the objectives and the hypothesis as follows:

- Demographic data would be analyzed in terms of frequency and percentage.

- Level of comfort would be analyzed in terms of frequency, percentage, mean, mean percentage and standard deviation
- The effect of inserting chilled nasogastric tube would be analyzed by unpaired t' test.
- Fisher's exact test would be used to find the association of level of comfort with the selected baseline variables in experimental and control group.
- The analyzed data would be presented in the form of tables, graphs, diagrams and figures.

## Results

### Organisation of findings

#### Section 1

This section deals with the description of the baseline characteristics of 40 patients and has been explained in terms of frequency and percentage and presented in tables and figures.

**Table 1: Frequency and percentage Distribution of subjects According to the Baseline Characteristics.**

SL No	Baseline variables	N=20+20			
		Experimental group		Control group	
		Frequency f	Percentage %	Frequenc y f	Percentage %
1	<b>Age in years</b>				
	a. 20-30	7	35	6	30
	b. 31-40	6	30	5	25
	c. 41-50	5	25	5	25
	d. 51-60	2	10	4	20
2	<b>Gender</b>				
	a. Male	8	40	7	35
	b. Female	12	60	13	65

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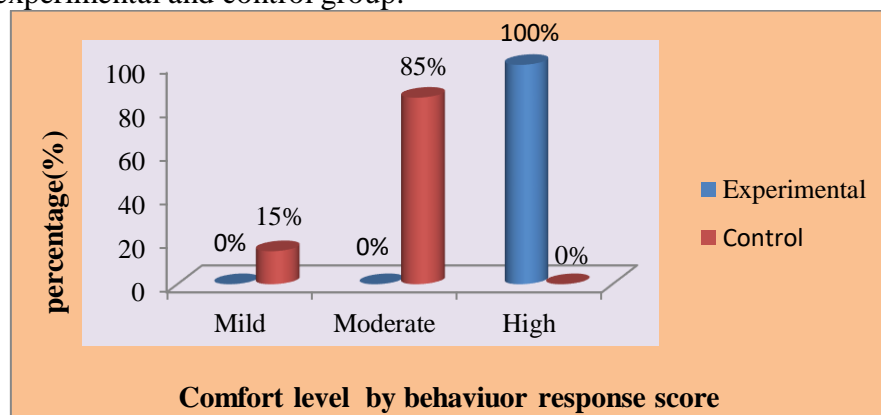
3	<b>Marital status</b>				
	a. Single	9	45	7	35
	b. Married	11	55	13	65
4	<b>Religion</b>				
	a. Hindu	14	70	9	45
	b. Christian	5	25	9	45
5	<b>Education</b>				
	a. Primary	13	65	12	60
	b. Higher secondary	4	20	6	30
	c. Graduation	3	15	2	10
6	<b>Occupation</b>				
	a. Homemaker	13	65	11	55
	b. Unskilled worker	4	20	7	35
	c. Professional	3	15	2	10
7	<b>Ward</b>				
	a. Surgery	20	100	20	100
8	<b>Indication for NG tube insertion</b>				
	a. Decompression	18	90	17	85

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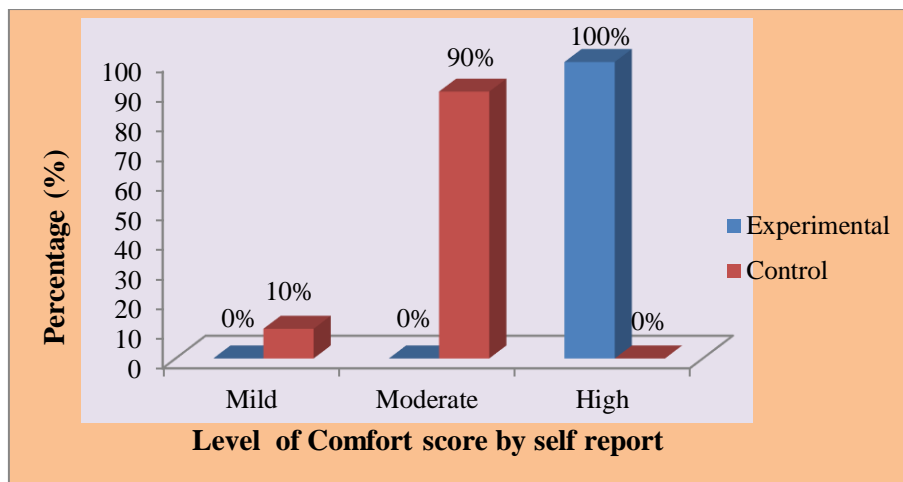
b. Feeding	2	10	3	15
<b>9 Earlier experience of NG tube insertion</b>				
a. First time	19	95	19	95
b. Second time	1	5	1	5
<b>10 Time duration for NG tube insertion</b>				
a. 2mts	14	70	1	5
b. 3-5mts	5	25	3	15
c. 6-8mts	1	5	16	80

## Section II

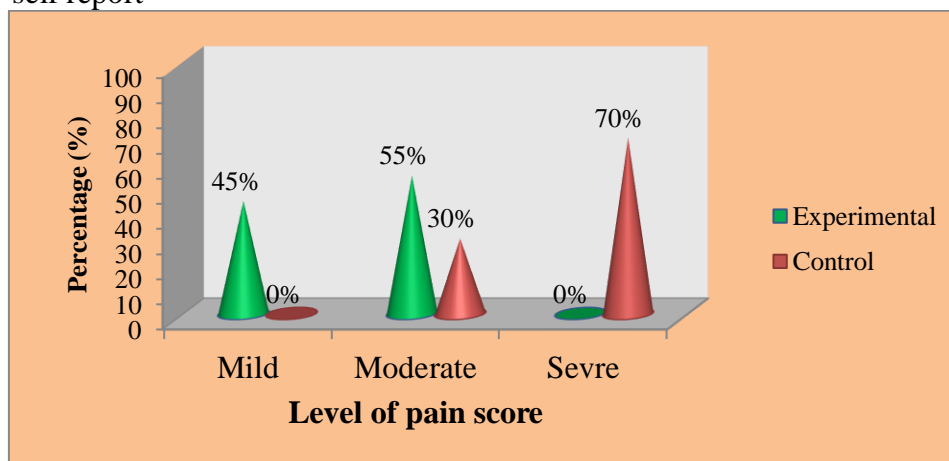
This section deals with the analysis and interpretation of the level of comfort scores of the subjects in the experimental and control group.



**Figure 1:** Bar diagram showing the distribution of level of comfort of subjects according to the behavior response scores in the experimental and control group



**Fig 2:**Bar Diagram showing the Distribution of subjects according to the Level of comfort scores by self report



**Fig 3:** Bar Diagram showing the level of comfort of subjects according to the level of pain scores in the experimental and control group.

**Section III**

This section deals with the analysis and interpretation of the data collected from the 40 subjects to evaluate the effect of inserting chilled nasogastric tube on level of comfort by using behaviour observational checklist on level of comfort, rating scale on level of comfort by self-report of the patient and numerical pain rating scale on level of comfort. Data regarding experimental and control group level of comfort score were analysed in terms of inferential statistics. In order to find out the significance between the Experimental and Control group Level of comfort Scores, Independent t' test was computed and the data is presented in Table-2.

**Section III: A. Table 2: Mean Score, Standard deviation, mean difference and 't' Value of level of comfort of subjects according to the Behavior response scores in the experimental and in Control group.**

Group	Mean score	SD	Mean difference	N=20+20	
				't' value	P value
Experimental	2	0.91	7	15.06 *	0.04*

<b>Control</b>	9	1.86			
t <sub>38</sub> = (1.69), p < 0.05			*significant		

**Section III: B. Table 3: Mean Score, Standard deviation, mean difference and 't' Value of level of comfort scores by self-report of the subjects in Experimental and Control group**

N=20+20					
Group	Mean score	SD	Mean difference	't' value	P value
<b>Experimental</b>	44.5	2.78			
			15.85	21.86 *	0.003*
<b>Control</b>	28.6	1.698			
t <sub>38</sub> =(1.69),p<0.05			*significant		

**Section III: C. Table 4: Mean, standard deviation, mean difference and 't' value of level of comfort of subjects according to the level of pain scores in the experimental and control group.**

N=20+20					
Group	Mean score	SD	Mean difference	't' value	P value
<b>Experimental</b>	1.90	1.02			
			4.35	13.84*	0.042*
<b>Control</b>	6.25	0.966			
t <sub>38</sub> =(1.69),p<0.05			*significant		

#### Section IV

This section deals with the association of level of comfort of the subjects with selected baseline variables among experimental and control group.

**Section IV: a. Association between the level of comfort of subjects according to the behavior response scores with the selected baseline variables.**

The calculated P values were greater than 0.05. Therefore, the null hypothesis is accepted and the research hypothesis is rejected for all variables, in the experimental and control group.

**Section IV: b: Association between the level of comfort score by self- report of the subjects with the selected baseline variables.**

The calculated 'p' values were greater than 0.05, except for education (P= 0.035). Therefore, the null hypothesis is accepted and the research hypothesis is rejected in the experimental and control group.

**Section IV: C: Association between the level of comfort of subjects according to the level of pain scores with the selected baseline variables.**

The calculated 'p' values were greater than 0.05. Therefore, the null hypothesis is accepted and the research hypothesis is rejected for all variables, in the experimental and control group.

#### Discussion

The present study intends to find the effectiveness of inserting chilled nasogastric tube on level of comfort of patients. The findings of the study are discussed here in comparison with the objectives and findings of other studies along with similar concern. In the present study, majority of the subjects, 7(35%) and 6(30%) belonged to the age group of 20- 30 years in the experimental and control group respectively. Similar findings regarding age group ranging from 18-39 years was noted in a study conducted on comforting strategies used during nasogastric tube insertion. The chilled nasogastric tube insertion has an impact on improving

the level of comfort in the experimental group. This interpretation is supported by the current results of level of comfort of subjects according to the behaviour response scores, where all the subjects in the experimental group 20(100%) experienced high level of comfort, where as in control group none of the subjects experienced high level of comfort. But in the control group 17(85%) had moderate level of comfort and 3(15%) had mild level of comfort. Physical response scores were very high in control group (mean=4.45±0.99) and procedural response score (mean= 1±0.31) was high in experimental group. In the control group the level of pain scores was severe (mean 6.25±0.966) when compared to the experimental group (mean 1.90±1.02). Statistically the difference between the level of comfort of subjects according to the level of pain scores in the experimental and control group was ( $p=0.042$ ) found significant.

### **Recommendations**

Keeping in view the findings of the study, the following recommendations are made:

1. The study could be replicated on a large sample drawn from different settings.
2. A similar study could be conducted to evaluate the sustained effect of insertion of chilled nasogastric tube on pain and behavioral response.
3. Further study could be conducted to see the combining effect of chilled nasogastric tube insertion with other direct and indirect comforting strategies.

### **Conclusion**

The following conditions were made based on the findings of the study.

- High level of comfort increases as the practice of insertion of chilled nasogastric tube.
- All the subjects in the experimental group had high level of comfort scores with the insertion of chilled nasogastric tube.
- Chilled nasogastric tube was found to be more beneficial in the physical behavior response area of level of comfort.

### **Financial Support and Sponsorship**

Nil

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## 3D Object Detection Using Marginal Space Learning in medical images

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**Abstract:**-In this paper presents an efficient 3D learning-based object detection method, called Marginal Space Learning (MSL). The idea of MSL is to avoid learning in the full similarity transformation space by incrementally learning classifiers in marginal spaces of lower dimensions. The estimation of an object's pose is split into three problems: position estimation, position-orientation estimation, and position-orientation-scale estimation. This incremental learning approach contributes to a highly efficient object detection paradigm. In addition, we introduce the steerable features, as a mechanism to search the orientation space, thus avoiding expensive volume/image rotations. The main idea is to sample points from a given volume under a sampling pattern that embeds the position, orientation, and scale information of a pose hypothesis. Each sample point is associated with a set of local features such as local intensity and gradient. The efficiency of steerable features comes from the fact that much fewer points (defined by the sampling pattern) are needed for manipulation, in comparison to the whole volume.

**II Introduction:**-Automatic detection of an anatomical structure (object) in medical images is a prerequisite for subsequent tasks such as recognition, segmentation, measurement, or motion tracking, and therefore has numerous applications. The goal of the detection is to estimate the position, orientation, and size of the target anatomical structure. The pose parameters can be represented as an oriented bounding box (to distinguish from an axis-aligned bounding box). Recently, discriminative learning based approaches have been proved to be efficient and robust to detect 2D objects. In these methods, object detection is formulated as a classification problem: whether an image window contains the target object or not. During object detection, the pose parameter space is quantized into a large set of discrete hypotheses and each hypothesis is tested by a trained classifier to get a detection score. The hypotheses with the highest score are taken as the detection results. Exhaustive search for the best hypothesis makes the system robust under local optima. This search strategy is quite different from other parameter estimation approaches, such as deformable models, where an initial estimate is adjusted using the gradient descent techniques to optimize a predefined objective function. There are two challenges to extend learning based object detection approaches to 3D. First, the number of hypotheses increases exponentially with respect to the dimensionality of the parameter space. Although the dimensionality of the image space only increases by one from 2D to 3D, the dimensionality of the pose parameter space increases from 5 to 9. For 2D object detection, there are five unknown parameters to be estimated or searched for from an input image, namely, translation in two directions, one rotation angle, and two scales. For 3D object detection, there are nine degrees of freedom for the anisotropic similarity transformation, namely three translation parameters, three rotation angles, and three scales. Note that the ordinary similarity transformation defines only isotropic scaling, corresponding to one scale parameter. However, to better cope with non rigid deformations of the target object, we use anisotropic scales. The number of hypotheses

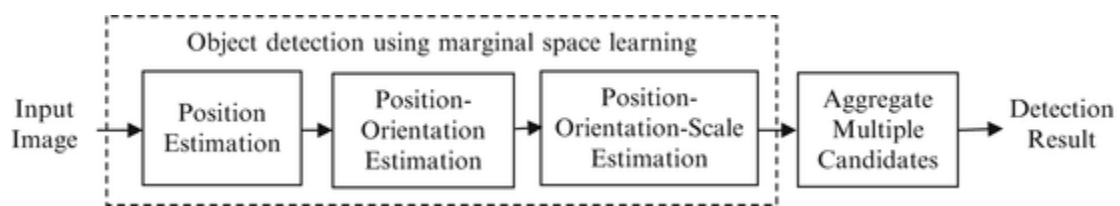
is an exponential function of the dimensionality of the pose parameter space. The second challenge of extending the learning based object detection to 3D is that we need efficient features to search the orientation space. To perform a classification to an orientation hypothesis, the image features should be a function of the orientation hypothesis. Since we want to explicitly estimate the orientation of an object, rotation invariant features cannot be applied. There are two ways to embed the orientation information into image features, rotating either the feature template or the volume. Haar wavelet features can be efficiently computed under translation and scaling using the integral images, but no efficient ways are available to rotate the Haar wavelet features. For 2D object detection, there is only one degree of freedom in rotation. The computation time to rotate a volume with  $512 \times 512 \times 512$  Pixels is equivalent to rotate 512 images each with  $512 \times 512$  pixels. Furthermore, there are three degrees of freedom in 3D rotations the presents solutions to the two challenges discussed above. First, it introduces an efficient 3D learning-based object detection method, called Marginal Space Learning (MSL). The idea of MSL is to avoid learning in the full similarity transformation space by incrementally learning classifiers in marginal spaces of lower dimensions. The estimation of an object's pose is split into three problems: position estimation, position-orientation estimation, and position-orientation-scale estimation. This incremental learning approach contributes to a highly efficient object detection paradigm. Second, we introduce the steerable features, as a mechanism to search the orientation space, thus avoiding expensive volume/image rotations. The idea is to sample points from a given volume under a sampling pattern that embeds the position, orientation, and scale information of a pose hypothesis. Each sample point is associated with a set of local features such as local intensity and gradient. The efficiency of steerable features comes from the fact that much fewer points are needed for manipulation, in comparison

**III 3D Object Detection:-**To train object detection classifiers, we need a set of 3D volumes, called the training set. The volumes in the training set are typically converted to a low isotropic resolution (e.g., 3 mm). For each volume, we need a nine dimensional vector of the ground truth about the position, orientation, and size of the target object in the volume. These nine pose parameters can be visually represented as a bounding box of the object. In some applications, the pose parameters are readily available from the annotation of the image data. This is especially common for 2D object detection since it is easy to draw a bounding box of the target object. However, drawing a 3D bounding box aligned with the orientation of the 3D object is not trivial. It is more convenient to annotate a few landmarks of the object and derive a box from the landmarks. Alternatively, since in many applications, the accurate object segmentation is the ultimate goal, a 3D surface mesh is annotated by experts for each volume in the training set, either manually or semi-automatically. The object orientation cannot be easily derived from a 3D mesh. Different methods are often demanded to define the orientation of different target objects. Many anatomies have an intrinsic, well-accepted orientation definition. For example, the orientation of the heart chambers, defined by the long axis and short axis we use the long axis of a chamber as the  $z$  axis. The perpendicular direction from a predefined anchor point to the long axis defines axis  $x$ . For different chambers, we have freedom to select the anchor point, as long as it is consistent. For example, for the left ventricle, we can use the aortic valve center as the anchor point. The third axis  $y$  is the cross-product of axes  $z$  and  $x$ . A  $3 \times 3$  rotation matrix  $\mathbf{R}$  is determined using the  $x$ ,  $y$ , and  $z$  axis as the first, second, and last column of  $\mathbf{R}$ , respectively. An orientation hypothesis is represented as three Euler angles,  $\psi$ ,  $\phi$ , and  $\theta$ , which can be derived from the rotation matrix  $\mathbf{R}$  using the following relationship

$$R = \begin{bmatrix} \cos \psi \cos \phi - \cos \theta \sin \phi \sin \psi & \cos \psi \sin \phi + \cos \theta \cos \phi \sin \psi & \sin \psi \sin \theta \\ -\sin \psi \cos \phi - \cos \theta \sin \phi \cos \psi & -\sin \psi \sin \phi + \cos \theta \cos \phi \cos \psi & \cos \psi \sin \theta \\ \sin \theta \sin \phi & -\sin \theta \cos \phi & \cos \theta \end{bmatrix}.$$

We then calculate a bounding box aligned with the object-oriented local coordinate system for the mesh points. The bounding box center gives us the position ground truth  $X_t$ ,  $Y_t$ , and  $Z_t$ , and the box size along each side defines the ground truth of scaling  $S_{xt}$ ,  $S_{yt}$ , and  $S_{zt}$ , respectively.

For object segmentation, we also need to calculate the mean shape from the training set so that after object pose estimation we can align the mean shape to get an initial estimate of the true shape. For a target object, using the above bounding box based method, we calculate its position ( $\mathbf{T} = [X, Y, Z]'$ ), orientation

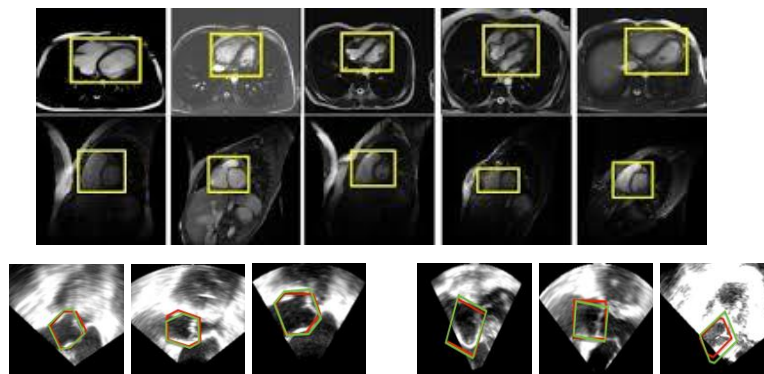


Block diagram for object detection using marginal space learning

**Algorithm 1** Learning algorithm with iterative threshold-enforced sparsity

- 1: Pre-training stage using all weights (small # epochs)
- 2: **for** # iterations **do**
- 3:   **for all** filter  $i$  with sparsity **do**
- 4:      $p$  - proportion of absolute smallest non-zero  $w^{(i)} \leftarrow 0$
- 5:     Re-normalize to preserve  $\|w^{(i)}\|_1$
- 6:   **end for**
- 7: Train network on active coefficients (small # epochs)
- 8: **end for**

#### IV Result



**Fig 1 Object detection window**

Fig. 1 shows typical segmentation results on two volumes. Accurate boundary delineation is achieved starting from the good initial estimate of the shape achieved by the proposed

method. After applying the learning-based iterative threshold-enforced, we achieve the detection from the image

**V.Conclusion:-**The Marginal Space Learning framework for efficient and robust scanning of 3D volumetric medical image data. We proposed to tackle the parameter estimation in hierarchical sub-spaces of increasing dimension by using a deep neural architecture, simplified through sparsity injection. The training of such a classifier is based on an iterative learning process. with the target of completing the detection with the full segmentation of the shape.

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## Study of Plastics in Injection Moulding Process

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**Abstract:**-Plastics were formerly thought to be cheap alternative to conventional materials like metal & wood. They have, nevertheless, become as indispensable as traditional materials themselves. Plastics have achieved this feat due to their unrivalled adaptability & capacity to alter their characteristics, which other materials lack. Without plastics, our modern lives would be unimaginable. Plastics help us to address issues that are intractable with traditional materials, whether in electronics, light engineering, medical technology, space technology, or machine & vehicle manufacturing, to mention a few examples. Plastics are composed up of polymers & other components that are mixed in to give them certain properties. Rubber, shellac, & gutta percha are natural polymeric materials with long history as man's raw materials. Celluloid, first thermoplastic, was likewise made from cellulose, natural substance. Some cellulose-based polymers, such as cellulose acetates, are still used today (CA). Cellulose is already made up of big molecules like those found in polymers (macromolecules). CA plastics must still be 'prepared' with acetic acid in order to be manufactured. In order to shape cellulose materials, first injection moulding machine was constructed & patented in 1872.

**1.1 Introduction:**-The great majority of plastics nowadays are made artificially, that is, macromolecules are made up of smaller molecules (predominantly from carbon & hydrogen). Plastics may be made essentially from their fundamental ingredients, carbon & hydrogen (coal & water). Plastics are currently almost completely made from products produced through fractionated distillation of crude oil for economic reasons, similar to how gasoline is made.

As a result, we may categorize plastics as follows:

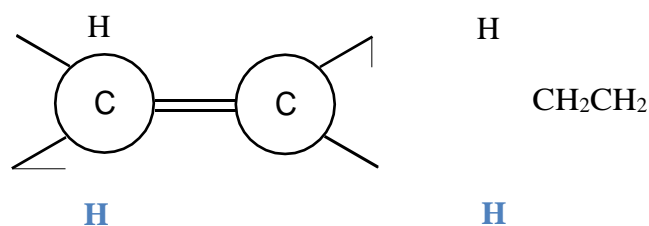
1. Natural-based plastics, such as celluloid, cellulose acetate, vulcanised fibre, & casein polymers (galalith)
2. Man-made plastics, such as polyethylene, polystyrene, & polyamide

However, whether plastics are made from naturally occurring big molecules or synthetically generated from smaller molecules, subsequent processing is unaffected. Bakelite, named after its inventor, Leo Baekeland, in 1907, was first synthetically produced polymer. The substance is a thermoset phenolic resin called phenol-formaldehyde. However, there was no solid knowledge of chemical structure of polymers until Herman Staudinger's study in 1924. Staudinger developed the notion of linear molecular chains & macromolecules, which, once accepted by the scientific community (which took several years), allowed synthesis & development of novel polymeric materials to begin. In the 1920s, this new knowledge of polymer structure enabled the creation of plastics such as polyvinyl chloride & cellulose acetate. Polyamides, polystyrene, & acrylics, as well as single & twin screw extruders for polymer processing, were introduced in the 1930s. New polymeric materials were developed on a regular basis, thanks to the Second World War, which accelerated their development. Epoxies, polyethylene, & acrylonitrile-butadiene-styrene (ABS), to mention a few, were all introduced

in 1940s. polypropylene industry, as well as polyethylene terephthalate (PET) & polycarbonate, all began in 1950s (PC). In 1970s, American firms produced variety of engineered materials, including polyphenylene sulphide & fluoropolymers like DuPont's (US) ethylene-tetrafluoroethylene copolymer Tefzel & perfluoroalkoxy plastics known as Teflon PFA. Dynamit Nobel (Germany) brought polyvinylidene fluoride (Dyflon) to market in 1973, & liquid crystal polymers were developed in 1980s. The cost & complexity of synthesising new materials has delayed creation of new polymers, although novel plastics are still being produced by combining old materials. Polymer alloys & blends are names for these materials. alloy has single glass transition temperature (which will be described later) & has better characteristics than its constituent parts. glass transition temperature of mix is different from that of original components, & characteristics of blend are similar to those of original materials. ABS is good example of commercially successful mix

### 1.2 Structure & Typical Properties of Polymers

The term polymer is derived from Greek words poli, meaning many, & meros, meaning pieces. This is due to fact that polymers are made up of many smaller, repeating components known as monomers. Ethylene is most basic & widely utilised monomer. It is made up of two carbon atoms (C) & four hydrogen atoms (H). It may be shown in two different ways, as illustrated in Figure 2.1. lines in this figure show bonds that connect atoms in molecule.



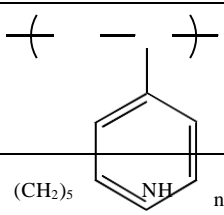
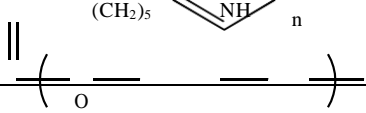
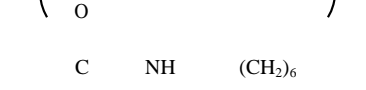
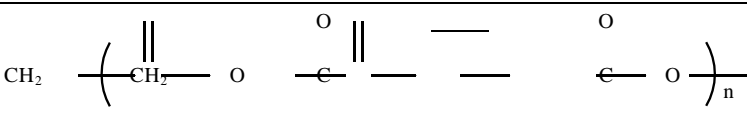
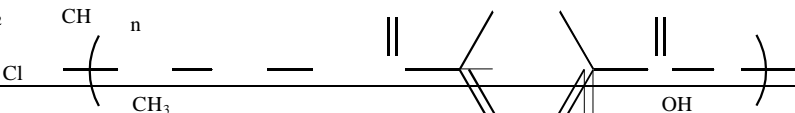
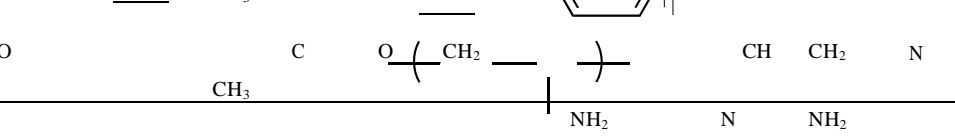
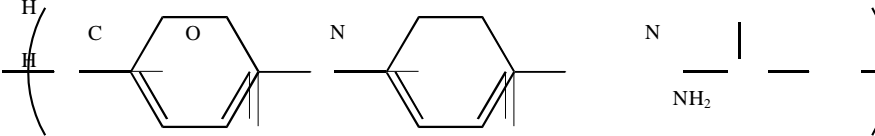
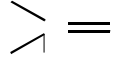
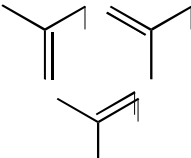
*Figure 1.1 ethylene molecule*

The presence of double bond between carbon atoms in ethylene permits polyethylene to be formed. This occurs when monomers are joined in polymerisation process to produce chain like one illustrated in Figure 2.2. functional polymer chain can be made up of 200-2000 monomers linked together. Addition polymerisation is name for this form of polymerization.

### 1.3 Formation of Macromolecules

For macromolecules, there are three different types of formation processes. Polymerisation is process in which polymers combine in lines to generate macromolecules with no by-products. Figure 1.2 has previously demonstrated this. degree of polymerisation refers to number of monomers present in macromolecule. Homopolymers are macromolecules that are made up of only one kind of monomer; ordinary polystyrene is example. Copolymers are macromolecules that have various monomers as part of their structure (mixed polymers). SB, for instance, is made up of styrene & butadiene monomers. acrylonitrile, butadiene, & styrene are three monomers that make up ABS. In poly condensation, monomers are broken apart by another material, generally water, to create macromolecules. When polymerization occurs at temperature above 100 °C, steam is produced. Depending on form of monomers, macromolecules produced by poly condensation can be made up of one kind of monomer (e.g., PA 6) or two distinct monomers (e.g., PA 66). Polycarbonate (PC) & linear polyesters like polyethylene terephthalate are further examples of polycondensates (PET). Poly addition is method of forming

macromolecules from monomers without use of cleavage products. Poly addition usually necessitates use of two distinct monomers. During this procedure, monomers undergo minor modifications. Between various monomers, few atoms swap positions. Polyurethane (PU) & epoxy resins are two examples (EP). The following injection moulding of thermoplastics is unaffected by kind of formation reaction. Before injection moulding occurs, molecules are already complete. To make component, they are simply heated & solidified in mould. However, if crosslinkage is caused by polycondensation, kind of formation reaction can have impact on thermoset processing. Indeed, mold's locking pressure must be high enough to prevent mould halves from being pushed apart by steam generation, resulting in porous or blistered component. During compression moulding or transfer moulding of thermosets, special attention should be paid to this. Because of high injection pressures necessary in injection moulding, mould clamp force must be high enough to prevent mould from being pushed open by steam.

Table 1.1 Characteristic structures of common polymers	
Polymer	Repeat unit(s)
Polyethylene (PE)	$\text{CH}_2 - \text{CH}_2 - \text{n}$
Polypropylene (PP)	$\text{CH}_2 - \text{CH} - \text{nCH}_3$
Polystyrene (PS)	$\text{CH}_2 - \text{CH} - \text{n}$ 
Polyamide 6 (PA 6)	$\text{C} - (\text{CH}_2)_5 - \text{NH} - \text{C} - \text{O} - \text{n}$ 
Polyamide 66 (PA 66)	$\text{C} - (\text{CH}_2)_4 - \text{C} - \text{NH} - (\text{CH}_2)_6 - \text{NH} - \text{n}$ 
Polyethylene terephthalate (PET)	$\text{CH}_2 - \text{CH}_2 - \text{O} - \text{C} - \text{O} - \text{n}$ 
Polyvinyl chloride (PVC)	$\text{CH}_2 - \text{CH} - \text{n}$ 
Epoxy resin (EP)	$\text{O} - \text{C} - \text{O} - \text{CH}_2 - \text{CH} - \text{CH}_2 - \text{N} - \text{n}$ 
Melamine-formaldehyde resin	$\text{H} - \text{C} - \text{N} - \text{N} - \text{NH}_2 - \text{n}$   

**1.4 Molecular Weight:** Many macromolecular chains of varying lengths or repeat units can be found in polymeric substance. average size of these chains determines polymer molecular weight, which is described by molecular weight distribution. Polymers can have side chains of different lengths in addition to backbone. characteristics of polymer are also affected by this branching from main chain. capacity of polymer chains to pack together is limited by branching. As result, density of polymer is affected by branching. High density polyethylene, for example, has very little branching, hence phrase high density; low density polyethylene, on other hand, has many branches. Table 2.2 shows how this affects both density & melting point.

Polyethylene	Melting point(°C)	Density(g/cm <sup>3</sup> )	Tensile strength(M Pa)	Number/type of branches
LDPE	110-120	0.91-0.93	17-26	Long branches
LLDPE	122-124	0.92	13-27	10-35 short branches (per 1000 carbon atoms)
HDPE	130-135	0.94-0.97	21-38	4-10 short branches (per 1000 carbon atoms)

It can be seen that properties of polymer are strongly linked to molecular weight & molecular weight distribution, & it is necessary to match molecular weight, material properties & flow characteristics in order to shape material during processing & give desired final product.

## 1.5. Plastics

Plastics are composed up of polymers & other components that have been added to make them more useful. amount of polymer in plastic can range from less than 20% to over 100%. phrase "prime grades" refers to plastics that are almost entirely made of polymer. Amount & kind of additional additives employed are determined by plastic's intended purpose. There is wide variety of materials available on market; in United States alone, there are over 18,000 distinct grades of plastic material. Thermoplastics, thermo sets, & elastomers are three primary types of plastics. This difference is made based on molecular structure as well as processing methods available. These three types of materials will be discussed presently.

### 1.5.1 Thermoplastic

When heated, these materials melt & flow, then harden when they cool. They recover their capacity to flow after re-heating. This means that by remelting them, they may be reprocessed & therefore recycled. Consumer products such as drink containers, carrying bags, & buckets are made of thermoplastics. Table 2.3 lists most popular thermoplastic materials & their uses. When thermoplastics solidify, they can take on one of two molecular structures: amorphous or semi-crystalline, both of which are shown in Figure 1.3. Semi-crystalline materials' molecular structure tends to become highly organized as they cool, & crystals form. size of these crystalline areas is determined by structure of chains as well a space at which they cool. Unlike amorphous materials, which soften, these materials have sharp melting points. Semi-crystalline materials shrink more as result of this molecular rearrangement, with certain materials shrinking by as much as 20%. Because of molecular realignment produced by injection moulding process, this shrinkage will be greater in direction of flow.

Thermoplastic polymer	Applications
High density polyethylene (HDPE)	Packaging, pipes, tanks, bottles, crates



Low density polyethylene(LDPE)	Packaging, grocery bags, toys ,lids
Polypropylene(PP)	Caps, yoghurt pots, suitcases, tubes, buckets, rugs, battery casings
Polystyrene(PS)	Mass produced ransparent articles, yoghurt pots, fast food foamed packaging, cassettes
Polyamide(PA)	Bearings,gears,bolts,skatewheels,fishinglines
Polyethylene terephthalate(PET)	Transparent arbonated drink bottles
Polyvinylchloride(PVC)	Food packaging,shoes,flooring

Figure 1.3Semi-crystalline(left)&amorphous(right)materials

### 1.5.2 Thermosets

When Thermo set injection moulding chemicals are injected, they alter their structure. They are still made up of thread-shaped molecules, similar to thermoplastics, before injection moulding. During 'curing' process, however, molecules crosslink, producing dense network of linkages. material becomes rigid & brittle as result, & thermo set moulded components can no longer be melted. Because thermo set materials disintegrate before melting, they can't be recycled same way thermoplastics can. Figure 1.4 depicts variations in molecular organisation between thermoplastics &thermo sets. Thermo sets are frequently employed in applications where their strength & durability are required; list of popular thermo sets may be found in Table 1.4.

<b>Table 1.4Commonthermosetmaterials</b>	
<b>Thermoset polymer</b>	<b>Application</b>
Epoxy	Adhesives, electrical insulation
Melamine	Heat resistant laminate surfaces, i.e., kitchen worktops
Phenolics	Heat resistant handles for pans, irons, toasters
Polyurethane(PU)	Rigid or flexible foams for upholstery & insulation
Unsaturated polyesters	Partitions, to astersides, satellite dishes

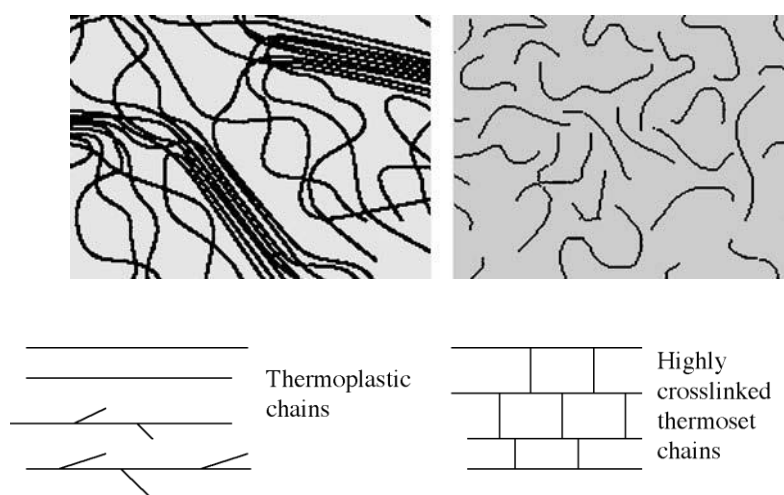


Figure 1.4Arrangements of thermoplastic &thermoset molecular chains

The diverse shapes of molecules give birth to different characteristics. structure of thermoplastic substances' molecules is not altered when they are injection moulded. molecules' mobility is only increased by melting. Thermo set plastics, on other hand, cannot be melted after they have cross linked. Thermo set materials, on other

hand, can only be deformed elastically & not plastically. stiffness of thermo set materials is determined by size of gaps between molecules' cross linking networks. material having big gap can be elastically deformed to great extent. Elastomers are another name for thermo sets.

#### 1.5.4 Elastomers

A polymeric elastomer, according to American Society for Testing & Materials (ASTM), is "a material that can be stretched repeatedly to at least twice its original length at room temperature & will return with force to its approximate original length upon prompt relaxation of stretch." In layman's words, this implies it's rubbery!

##### 1.5.3.1 Thermoplastic Elastomers (TPEs)

For long time, thermo set type polymers with permanent cross links, such as poly isoprene, were only elastomer materials available (natural rubber). However, one significant disadvantage of these materials was their inability to be recycled, prompting creation of thermoplastic elastomers (TPEs). Styrene-butadiene-styrene is typical example (SBS). Because styrene & butadiene do not combine, when SBS is heated, styrene breaks apart, allowing material to be re-melted. TPEs have number of benefits over thermo set elastomers, including:

- Reduced component prices owing to decreased material density
- Shorter cycle times
- Recyclable scrap & parts
- Colorable

Advanced processing techniques like as over-moulding have also benefitted TPE market. TPEs have been utilised in applications such as

- Gaskets, seals, & stoppers because of their capacity to be employed alone or in conjunction with other materials.
- Handles, grips, & knobs
- Handles, grips, & knobs

The reduced modulus & flexibility of thermoplastic elastomers are what have made them so economically successful. They are useful for applications such as sealing rings because of their capacity to rebound from stress & return to their original shape. Of course, thermosetting rubbers have been around for long time, & TPES is designed to replace them. While other material types have evolved in recent years, block copolymers (styrenics, copolyesters, polyurethanes, & polyamides) & thermoplastic/elastomer blends & alloys are two main forms of TPE (thermoplastic poly olefins & thermoplastic vulcanisates). Because hard thermoplastic phase is mechanically or chemically linked with soft elastomer phase, certain TPE kinds are known as two-phase systems. As result, TPE with characteristics from two stages has been created. The use of thermoplastic elastomers has risen dramatically in recent years & is likely to continue. In 2000, global consumption was projected to be 1,400,000 metric tonnes per year. Table 2.5 lists some examples of common thermoplastic elastomers. TPE's appropriateness will be determined by characteristics like as hardness & compression ratio, in addition to adhesion concerns. Hardness is measured on durometer using Shore Hardness scale & is

defined as material's resistance to indentation. TPEs are typically graded on Shore scale, with softest materials ranging from 3 Shore to 95 Shore A. Thermoplastic materials, for example, are graded on separate scale, Shore D scale. This provides visual representation of variations in characteristics. TPE material grades come in variety of hardness levels, but it's important to remember that hardness is also function of material's thickness & substrate beneath it. Thinner layer of elastomer on substrate in multi-shot applications, harder it will feel owing to influence of harder substrate beneath it.

<b>Table 1.5 Examples of TPEs &amp; substrates</b>		
<b>Type</b>	<b>Elastomer description</b>	<b>Subgroup</b>
TPE-O	Poly olefin blends	PP/EPDM PP/EPDM cross linked
TPE-V	Polyolefin alloys	Various
TPE-S	Styrene	SEBS BS SEBS/PPE
TPE-A	Polyamide	PA12 based PA6 based
TPE-E	Polyester	Polyester ester Polyether ester
TPE-U	Polyurethane	Polyester urethane Polyether ester urethane Polyether urethane
SEBS=styrene-ethylene/butylene-styrene terblock copolymer		

For sealing applications, compression set (CS) is measurement of deformation following compression for given deformation, time, & temperature. ASTM D395 or ISO 815 are most used test methods. As result, compression set of 100% represents material that did not recover, compression set of 0% represents material that behaved entirely elastically, & value of 30% represents material that returned 70% of its previous thickness.

$CS(\%) = [(h_i - h_f) / (h_i - h_c)] * 100$  where  $h_i$  is beginning height,  $h_f$  is final height, &  $h_c$  is height during compression. The standard technique requires 25% distortion; greater deformation, lower compression set.

### 1.5.3.2 Formulation of Plastics

Plastics are made up of polymers & other components, as described previously in chapter. Many commercially accessible additives that can be combined with polymers are available. Reinforcement with glass or carbon fibre, for example, increases strength. Flame retardants can be applied to make material more resistant to flames. They can be coloured with pigments for aesthetic or technical reasons, or stabiliser compounds can be added to make them more heat & light resistant. These are just handful of countless options available. Further more, amounts of each of these additives may be adjusted. It's simple to understand how there are so many different types of plastic. It should now be clear how they were able to compete so well with other materials such as glass, metal, & wood. Table 1.6 is list of some of most prevalent plastic additives. Polymer composites are plastics that contain reinforcing

elements such as glass fibre or clay. Composites can be produced with thermo plastic & thermo set polymers, as well as materials like glass & carbon fibres, to improve tensile stiffness & strength of final product. Polymer composites are frequently utilised in wide range of applications because of their excellent strength-to-weight ratio. These characteristics have been used extensively in automobile sector to reduce weight & increase fuel economy by replacing metal components.

<b>Additive</b>	<b>Purpose</b>
Reinforcement, e.g., glass fibre	Increased strength & stiffness
Extenders, e.g., calcium carbonate	Cost reduction: much cheaper than polymer
Conductive fillers, e.g., aluminium powder	Improved thermal & electrical conductivity
Flame retardant	Increased fire resistance
Light stabilisers	Increased resistance to degradation from daylight
Heat stabilisers	Increased resistance to degradation from elevated temperature exposure
Pigments	Give colour, improved aesthetic properties
Plasticisers	Improved flow properties & increased flexibility
Coupling agents	Improved interface bonding between polymer and Are in forcing agent
Foaming agents	Lightness & stiffness
Mould release agents	Processing aids
Antistatic additives	Prevent dust build up on consumer items

**Conclusion:-**The injection moulder is mainly interested in qualities that are required to melt injection moulding compound & inject it in to mould. Because various plastics react differently to heating based on holding strength of chains of molecules, knowing temperature at which specific plastic turns molten is critical. We also need to know breakdown temperature, which is temperature at which molecular chains disintegrate into smaller chains or original materials. This is known as gasification, & it shows that material has been severely damaged.

In general, forces that maintain molecule in material composition are weaker than chemical connections between atoms. As result, materials containing chemical linkages, such as cross linked thermo sets, are significantly more difficult to break down than thermoplastics. Intermolecular forces are higher in polymers containing polar component (e.g., CN, NH, CO) than in those without. Polar groups, on other hand, have larger dielectric losses due to their dipole nature.

The impacts of processing on thermoplastic materials will now be studied in order to understand what happens to polymers during injection moulding. In its most basic form, processing is act of melting, shaping, & hardening liquid.

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## A Survey Paper on Automatic Speech Recognition

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**Abstract**— The target of this paper is to show a diagram of the procedures utilized in discourse acknowledgment frameworks. In this paper, we talk about the sorts of discourse acknowledgment exhibiting the improvement in the field to help give an innovative point of view of the advancement made in the field. Further, it features the basic standards and techniques for Speech Recognition to comprehend the fundamental structure required to fabricate the innovation. What's more, this paper talks about the different ways to deal with ASR and the arrangement procedures of the Speech Recognition System-HMM, DTW, MLP, alongside their favorable circumstances and impediments. Following quite a while of research, the productivity of an ASR framework and its exactness remains the most vital test. This paper endeavors to audit the essential innovation of Speech Recognition, in view of which we can fabricate the most developed frameworks conquering the difficulties we confront as of now.

**Keywords**- Automatic Speech Recognition (ASR), Feature Extraction, Pattern Matching, Reference Pattern, Hidden Markov Model(HMM), Dynamic Time Warping(DTW), Multilayer Perceptron (MLP).

**INTRODUCTION**:-Discourse has been an intriguing object of research for quite a while now. Utilizing discourse to offer directions to the gadgets and working them effortlessly has been the point of research since the start. Discourse is changed over into writings for simple correspondence between a man and a machine which is encouraged by the methods for characteristic dialect correspondence. This exploration is framing the premise of man-machine interface to be utilized in many ventures and is the base for changing the manner by which machines take directions. Discourse Recognition empowers the machines to capture the discourse of the client and act as needs be. The capture attempt is for the most part taken care of by discourse flag handling and example acknowledgment. With enhanced equipment and programming, PC data handling innovation has turned out to be a standout amongst the most generally critical mechanical improvements. The discourse acknowledgment is cross-disciplinary including acoustics, phonetics, etymology, data hypothesis, design acknowledgment, nervous system science, flag handling, brain science, physiology and even the investigation of human non-verbal communication. [1] In area II, we talk about the kinds of discourse acknowledgment which ranges from secluded words to unconstrained discourse. The primary point is to create machines that can appreciate the normal dialect spoken by people. Area III talks about the essential standards and techniques for the Speech Recognition Technology dependent on which we can manufacture the key ASR framework. It depends on the Pattern Recognition strategy, including Feature Extraction, Pattern Matching and a Model Reference Library. Area IV examines the distinctive ways to deal with build up an Automatic Speech Recognition System, that are, Acoustic-Phonetic Approach, Pattern Recognition Approach, Dynamic Time Warping Approach and the Artificial Intelligence Approach. Segment V displays the different grouping procedures of the Speech Recognition System specifically, HMM, DTW and MLP, alongside their points of interest and impediments to depict the different qualities of every classifier to be utilized in the innovative work. At last, the paper talks about the confronting difficulties of the field in segment VI.

### TYPES OF SPEECH RECOGNITION

1. *Isolated Words*: In this sort of acknowledgment, a solitary articulation is distinguished

by the recognizer. It is necessitated that the expression must have a tranquil foundation, which implies coming up short on a sound flag. In any case, it doesn't imply that a solitary word is a solitary articulation. The articulations should be detached in nature, for example they ought to have "Tune in" and "Not Listen" states with a period interim among utterances. [3]

2. *Connected Words*: As a headway of perceiving single expressions, associated word recognizers enable the articulations to be spoken together to frame associated words. Just a base respite is proposed between articulations. [3]

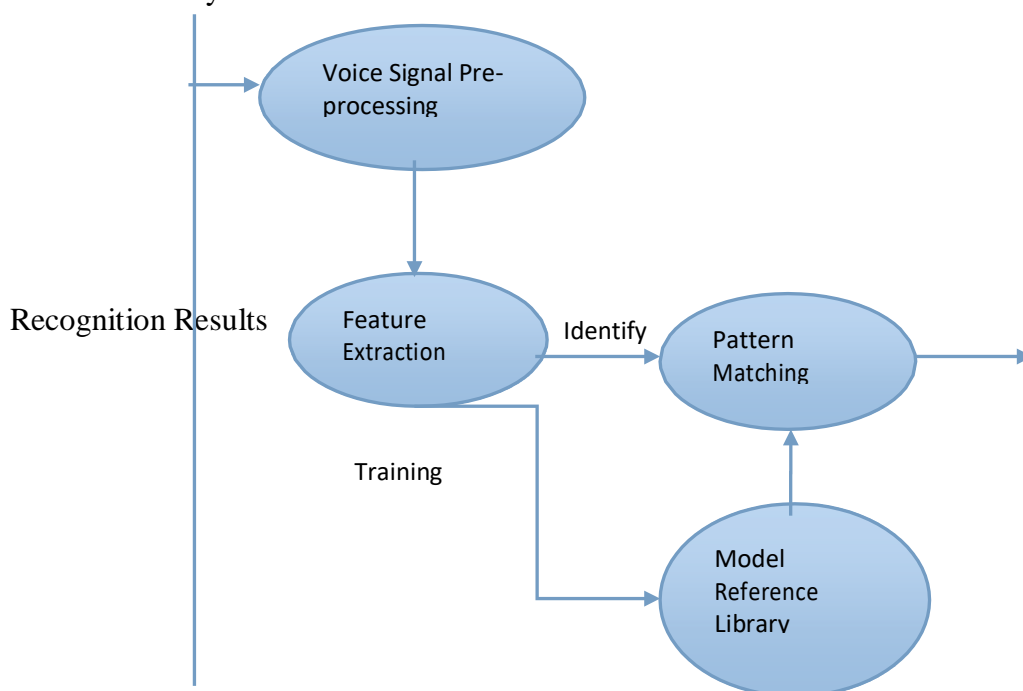
3. *Continuous Speech*: The following headway is the acknowledgment of ceaseless discourse. The primary issue here is choosing the expression limits in a discourse input. These recognizers help in perceiving the substance from a familiar speaker, without "Tune in" and "Not Listen" states. [3]

4. *Spontaneous Speech*: The most regular type of discourse is called Spontaneous Speech. The fundamental plan of building an ASR System is to appreciate the regular dialect addressed a machine by the client. These might incorporate perceiving highlights like falterers or the words that run together. [14]

## BASIC PRINCIPLES AND METHODS OF SPEECH RECOGNITION TECHNOLOGY

The basic speech recognition model is based on a pattern recognition system and includes the following features: [1]

- 1.Feature Extraction
- 2.Pattern Matching
- 3.Model Library for reference



**Figure 1:** Basic Principles of Speech Recognition System [1]

In the English dialect, discourse can be separated into different major structures framing a word. These central units of the verbally expressed dialect are called phonemes. The English dialects contains 44 phonemes that can together speak to every one of the vowels and consonants in the dialect.

**Voice Signal Preprocessing:-** This is the main stage in the discourse acknowledgment innovation. In this stage, an obscure voice is contribution to the framework with the assistance of a receiver. This information voice flag is then changed to an electrical flag. At

that point, a voice display is set up by the framework as per the human attributes. The procedure at that point proceeds onward to the following stage Feature Extraction. [1]

**Feature Extraction:-** In straightforward words, all the imperative qualities of the information voice that characterize it are separated and a voice format is created. Highlight extraction is principally used to figure a component vector succession to speak to the info flag. There are three phases of highlight extraction: [3]

**1.Speech Analysis or Acoustic Front End:** In this stage, spectrotemporal analysis of the input signal are performed and raw features describing the envelop of the power spectrum of short speech interval are generated.

**2.Compilation:** In this stage, a feature vector is compiled that comprises of the static and dynamic features.

**3.Transformation:** This stage, although not always present, transforms the feature vector from the second stage into more compact vectors which are then supplied to the recognizer.

- The most agreed upon features in these stages are: [3]
- An automatic system should help in distinguishing between different, though similar sounding speech.
- Without the help of training data, an automatic creation of acoustic models should be made for these sounds.

1. Invariant statistics across speakers and speaking environments should be shown.

**Pattern Matching :** Computers area unit then employed in the popularity method for matching. The hold on voice guide is matched with the characteristics of the input voice signal. Search and Matching Techniques facilitate in distinguishing the optimum vary of the input voice matching the guide. [1]

**Model Reference Library:** The reference library comprises of all the discourse flag formats which are contrasted and the information motion amid Pattern Matching, to distinguish and perceive the discourse flag input. [1]

### **APPROACHES TO ASR**

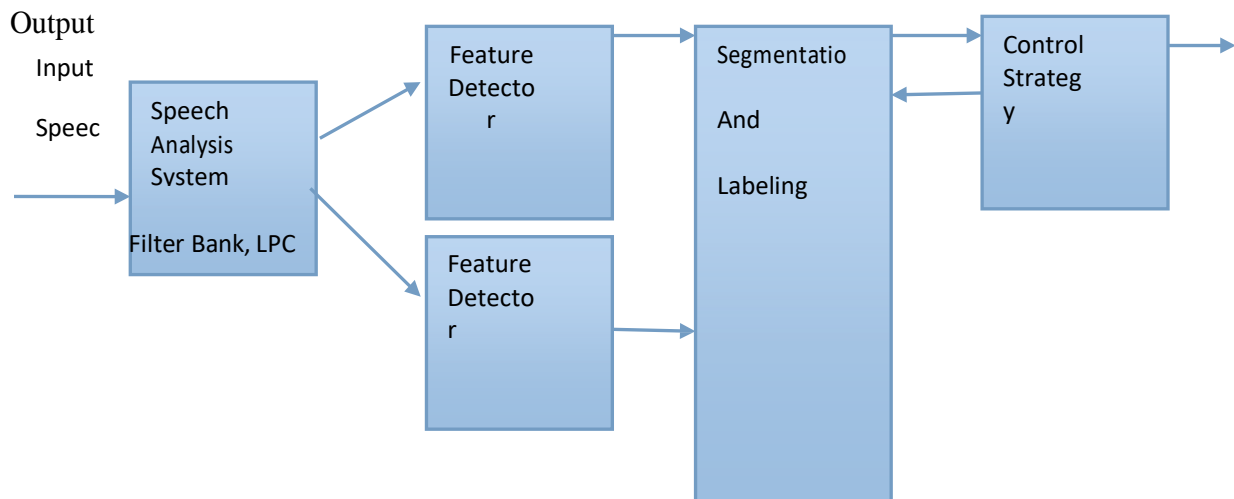
There are three main approaches to speech recognition.

#### **1. Acoustic-Phonetic approach:**

The fundamental guideline of this methodology is that the human dialect comprises of a limited and particular phonemes and these phonemes, however truly factor, are administered by an expansive number of principles which can be promptly learnt by a machine. In the least complex words, sounds are perceived, named and referenced later on for acknowledgment. This factor has been abused for the acoustic-phonetic methodology which is separated into the accompanying advances:

- Spectral analysis of speech
- Feature Extraction, where the spectral measurements describe a set of features that describe acoustic properties of the processed speech signal.
- Segmentation and Labeling, where the input speech signal is segmented into acoustic regions and phonetic labels are given to each segment for accurate identification.
- The most important step is the last step that determines the valid word for the phonetic label. After that, certain linguistic constraints on the task are used to decode the word.

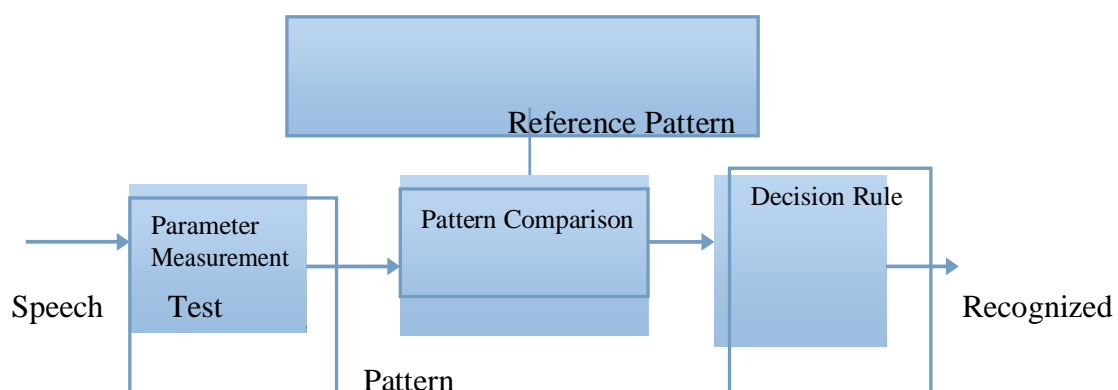




**Fig 2:** Acoustic phonetic speech recognition system[8]

2. **Pattern Recognition approach:**-Example Recognition has been predominant in this space throughout the previous six decades. It includes two stages: Pattern Training and Pattern Comparison. Amid example preparing, named preparing tests by means of a formal preparing calculation are framed for coordinating later on. In example examination, the obscure discourse input is contrasted and the discourse tests framed amid the example preparing and exact discourse design portrayals are shaped. Example acknowledgment can be done as two kinds:

- **Template Based Approach:** A past filled with the hopeful's word reference frames the layouts for examination, put away as models of the applicant's discourse and is referenced for coordinating the info flag and create fitting outcomes. Yet, after at some point, the reference library estimate builds exponentially and it is encouraged to store discourse outlines as examples and to look at the ghastly varieties of the examples for finding a match.
- **Stochastic Approach:** This is utilized if there should be an occurrence of questionable data. Probabilistic models like Hidden Markov Model utilize the key highlights of the Speech Recognition method change parameters and worldly changeabilities, and parameters in the yield dissemination and ghastly fluctuations.



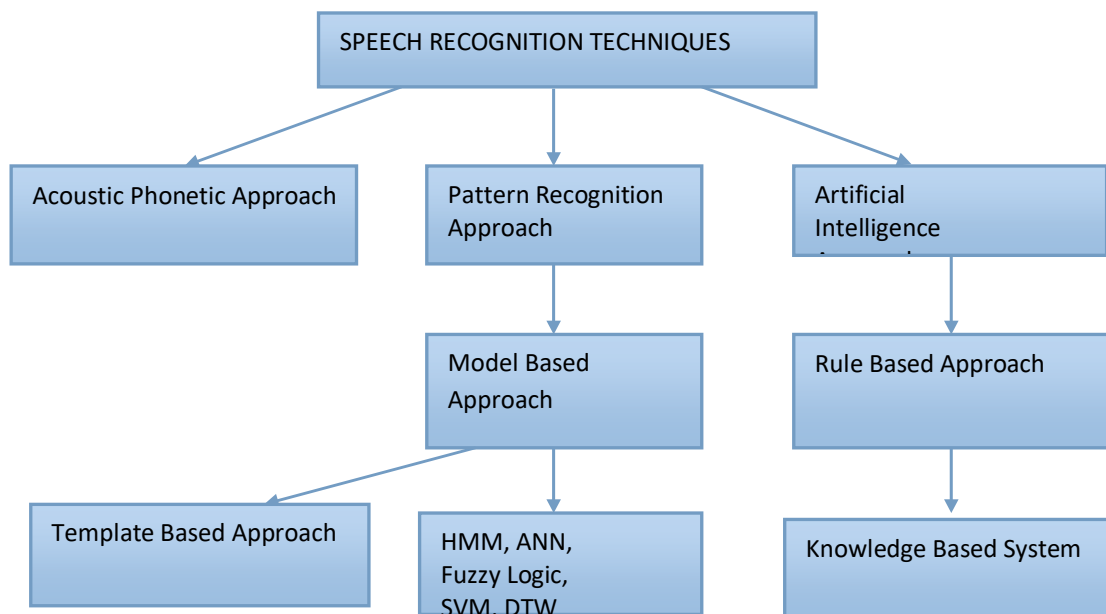
**Fig 3:** Pattern Recognition Approach to speech Recognition[8]

3. **Dynamic Time Warping(DTW):** This calculation is utilized to gauge the likenesses in two discourse flags that differ in time and speed. It has been connected in video and sound considering, normally where any type of information can be spoken to directly. In discourse

acknowledgment, DTW helps in addresses with various velocities. In straightforward words, DTW helps in discovering likenesses in two given information remembering the different imperatives included. [3]

4. **Artificial Intelligence (AI) Approach:** Man-made consciousness has dependably been a captivating part of science that helps in comprehension and impersonating the human conduct in specific circumstances. The fundamental thought in utilizing an Artificially Intelligent Approach here is to perceive the highlights of a discourse dependent on the manner in which an individual applies his knowledge in breaking down, envisioning and describing. A specialist framework is connected that joins the working of the phonemic, lexical, syntactic, semantic and down to earth learning. These measures highlights help in fragmenting and naming the discourse. Counterfeit neural systems are additionally used to figure out how the phonetic occasions are associated with one another just as mentally to the speaker. [3]

### Taxonomy of Speech Recognition [3]



### CLASSIFICATION TECHNIQUES OF SPEECH RECOGNITION SYSTEM

Various classification techniques of speech recognition system have been discussed below:

*HMM:* [6]

HMM, also known as a Hidden Markov Model, can be portrayed as an accumulation of states that are associated by advances. There are two arrangements of probabilities conveyed by each progress. First is, Transition likelihood. This demonstrates the likelihood of taking this progress. Second is, Output Probability Density Function. On the off chance that a progress is taken, this likelihood, gives the contingent likelihood of emanating each yield image from limited letter set. It helps in finding an arrangement way between various discourse sounds and diverse model states, and the systems for assessing the parameters of models from a preparation set of articulations of sounds being checked.

**Table I:** Advantages and Disadvantages of HMM

Name of the classifier	Characteristics [6]	Advantages [8]	Disadvantages [8]
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<p>Hidden Markov Model</p>	<ul style="list-style-type: none"> <li>➤ The parameters</li> <li>➤ The statistical characteristics of the signal are described by two inter related processes.</li> <li>➤ These characteristics can be hidden or unobserved finite- state Markov chain, and an observation vector that is associated with each state of the Markov chain.[6]</li> </ul>	<ul style="list-style-type: none"> <li>➤ Gives a better compression as compared to a simple Markov Model.</li> <li>➤ HMM can be extended to deal with strong tasks.</li> <li>➤ HMM uses a technique called "embedded re-estimation" in which HMMs are dynamically assembled according to class sequence. To know the class sequence, the most probable paths are calculated.</li> <li>➤ The traversed path corresponds to a sequence of class which gives us our final classification. Embedded re-estimation can help in including high-level domain knowledge, which</li> <li>➤ HMM is scalable.</li> <li>➤ New data can be added, without affecting the previous HMMs.</li> <li>➤ HMMs can also be Incremental [8]</li> </ul>	<ul style="list-style-type: none"> <li>➤ To use HMM to its full potential, the model has to be trained on a set of seed sequences and that requires a larger seed as compared to a simple Markov model.</li> <li>➤ Different HMMs are possible for a given set of seed sequences and choosing one can be difficult.</li> <li>➤ Larger models can fit the data in a better way, but smaller models can be understood better.</li> <li>➤ Assumptions about the data are made.</li> <li>➤ A large number of parameters need to be set for an HMM.[8]</li> </ul>
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DTW: [6]

Dynamic time traveling, likewise alluded to as DTW, is a calculation that is utilized for estimating the similitudes between two successions which fluctuate in variables like time or

speed. Programmed Speech Recognition is a famous execution to assist adapt to various talking speeds. In straightforward terms, DTW is a strategy that guides a PC to locate an ideal match between two given arrangements, thinking about specific confinements. One case of these successions can be a period arrangement. Non-direct "Distorting" is connected on these groupings in the time measurement to figure a proportion of their closeness which is free of non-straight varieties in the time measurement. This arrangement technique is regularly utilized with regards to shrouded Markov models.

**Table II:** Advantages and Disadvantages of DTW

Name of Classifier	Characteristics [6]	Advantages [8]	Disadvantages [8]
Dynamic Time Warping	<ul style="list-style-type: none"> <li>➤ It is a method that allows a computer to find an optimal match between two given sequences with certain restrictions to determine a measure of their similarity independent of certain non-linear variations in the time dimension. [6]</li> </ul>	<ul style="list-style-type: none"> <li>➤ Efficiency of DTW is very high for a small number of templates i.e. less than 20.</li> <li>➤ DTW is language independent.</li> <li>➤ It can be controlled by the end user and can be trained easily.</li> <li>➤ DTW can be called a cost minimization technique. It has a reference template according to which a test signal is stretched or compressed.</li> <li>➤ DTW has a very simple hardware implementation, hence it is used in mobile devices.</li> <li>➤ As compared to HMM, the training procedure is very fast and simple.</li> <li>➤ We can impose constraints that prevent the use of sequences that are not optimal, thus reducing the computational complexity. [8]</li> </ul>	<ul style="list-style-type: none"> <li>➤ DTW is speaker specific.</li> <li>➤ It requires actual training samples.</li> <li>➤ In some cases, a point on a time series can map to a large subsection of another time series in certain alignments.</li> <li>➤ DTW may prevent the correct warping from being discovered. Sometimes, features like peak, valley, inflection, plateau, point are higher or lower than their corresponding feature in another sequence by a small margin, and this Prevents in finding the natural alignments in two sequences which otherwise would have been obvious. [8]</li> </ul>

*MLP: [13]*

MLP, otherwise called Multilayer Perceptron is a type of an Artificial Neural Network display. The idea of MLP is feed forward. This model guides in mapping input information onto fitting yields. A MLP involves a coordinated chart with various layers with hubs. In this diagram, each layer is associated with the following one. But the information hubs, each hub speak to a neuron and have a non-direct actuation work. A system called "Back Propagation" is utilized by MLP, which is a regulated learning method and is utilized to prepare the system. MLP can recognize the information that isn't distinct straightly and is a change of the standard direct perceptron and can recognize information that are not straightly distinguishable.

**Table III:** Advantages and Disadvantages of MLP

Name of the classifier	Characteristics[13]	Advantages[13]	Disadvantages[13]
MLP	<ul style="list-style-type: none"> <li>➤ All the neurons in a Multilayer perception (MLP) have a linear activation function. It can be easily proved that the standard two-layer input- output model can be obtained by reducing any number of layers since it maps the weighted inputs to the output of each neuron.[13]</li> </ul>	<ul style="list-style-type: none"> <li>➤ Adaptive learning: MLP can learn how to do the tasks given, based on the experience or training data.</li> <li>➤ MLP is well suited for gesture recognition.</li> <li>➤ In comparison to other probability based models, MLP or Neural networks do not make assumptions regarding the probabilistic information about the pattern classes under study.</li> <li>➤ The required decision function is produced directly</li> </ul>	<ul style="list-style-type: none"> <li>➤ The dependency of MLP is entirely on the algorithms used to create it. It does not scale well.</li> <li>➤ Once MLP has been trained, it cannot be updated without retraining.</li> <li>➤ MLPs previous knowledge cannot be preserved after retraining.[13]</li> </ul>

### THE FACING PROBLEMS

The exploration in the field of Speech Recognition has been moderate and there has not been a noteworthy achievement since the initiation of the thought. The fundamental disadvantage of the idea is its reliance on nature. The earth in which the examples are made are the best to perceive future discourse inputs. Likewise, the frameworks don't perceive blunder in the info.

The primary requirement for the discourse acknowledgment framework is to pick up proficiency in the boisterous situations, despite the fact that it has not yet been accomplished. Another issue is the variety in the highlights of discourse with every speaker, similar to voice, discourse rate, articulation, pitch, volume. Another methodology for flag examination and preparing must be defined for enhanced effectiveness. The point by point comprehension of the mind control component is as yet uncertain to us, and up to that point, discourse acknowledgment will be somewhat troublesome. [1]

## **CONCLUSION**

Among people, discourse has dependably been the most helpful type of correspondence. Discourse Recognition innovation has computerized the machines' work easily. Analysts have aggregately been moving in the direction of a shared objective, for example to empower common discussion among man and the machine. The whole research has framed venturing achievements in the voyage with the point of decreasing the hole between the acknowledgment capacity of machines and that of people to a greatest degree. In spite of the fact that there are as yet numerous common difficulties in this field, the utilization of Speech Recognition Technology in our everyday lives will be broad and is probably going to spread to different gadgets that we use in our everyday lives. It won't astonish in the event that we begin offering directions to our espresso creators or our printers, with the assistance of this progressive innovation. Research in discourse acknowledgment has developed significantly over the quick five decades. It has made a solid effect on society and has built up the region of human-machine communication. We trust that the thorough audit of different methodologies in this paper has shown a superior point of view towards the mechanical progressions in the area.

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## Video Retrieval using Textual Queries and Spoken Text

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**Abstract:-** The expanded accessibility of broadband associations has as of late prompted an increment in the utilization of Internet webcasting. Most webcasts are filed and got to various times reflectively. One test to skimming also searching through such documents is the absence of text transcripts of the webcast's channel. Translation of addresses is testing task, both in acoustic and in dialect illustrating. Recording lectures and putting them on the Web for access by understudies has turned into a general pattern at different colleges. To take full pick up of the information database that is manufactured by these records involved inquiry usefulness must be given that goes past pursuit on meta-information level however performs an itemized examination of the relating multimedia reports. Videos and Texts demonstrated in lecture are nearly identified with substance of the lecture, gives important source for recovering lecture videos and indexing. Text substance may be separated, then analyze and deducted consequently by OCR (Optical Character Recognition) strategies. In this paper, for remedying lapses in the OCR Transcriptions, we investigated two separate systems connected just to unmatched question words. In any case methodology delivers another arrangement of n-gram strings to coordinate the unedited OCR Transcriptions. These n-gram incorporate strings with an altered separation of 1 character and all conceivable n-gram substrings with no less than 3 characters. Second system for redressing OCR included the word reference of spelling adjustment strategy gave in MS Words. The peculiarities of MS Word 2000, an OCR perceived string was extended through an application program interface into its corrected spellings. An exceptionally progressive style, just growing words that MS Word had flag as erroneously spelled which we depict before. This significantly decreased the quantity of spurious word competitors and maintained a strategic distance from false matches.

**Keywords:** Lecture videos, automatic text indexing, n-gram string, OCR, lecture video.

### 1 Introduction

In the earlier decade, we have seen an extraordinary augmentation in the availability of on-line scholastic address material. These instructive resources can possibly change the manner in which people learn understudies with a handicap can update their instructive experience, specialists can remain mindful generally movements in their field and people of any age can satisfy their crave information. In complexity to numerous other informative exercises be that as it may, lecture transforming has as of not long ago delighted in little advantage from the advancement of human language innovation. In spite of the fact that there has been noteworthy exploration controlled to audio indexing and retrieval. Embedded content in a feature grouping gives important data of foremost essentialness. Messages more often than not show up as logos, subtitles, inscriptions or pennants in the feature grouping. Illustrations of such educational embedded writings can be to a great extent found in the news and other famous TV broadcastings. Notwithstanding the way that messages give additional information, few out of every odd one of them are basic as they may square basic assignments of a video. There are a few contrasts in the middle of news and lecture speech such as an abstract style and an accessible asset. These days, numerous telecast organizations give news cuts a comparing script through online administration. Since we can without much of a stretch form a preparing corpus utilizing this, telecast news retrieval has been a significant concentrate in talked report retrieval territory. In any case, they as of now give watchword hunt administrations utilizing a content search engine focused around the news script. Dissimilar

to news, we can't undoubtedly get a script of lecture speech. In a business education site, an inquiry is performed utilizing a physically fabricated record. Text is a high state having semantic features which has regularly been utilized for content-based information retrieval. In lecture videos, writings from lecture slides serve as a layout for the lecture and are critical for comprehension. In this manner in the wake of segmenting a video document into a set of key frames, the content detection method will be executed on each one key edge, and the extricated content articles will be further utilized as a part of content recognition also slide structure investigation forms. Particularly, the removed structural metadata can empower more adaptable video browsing and video pursuit capacities. Discourse is a champion among the most fundamental transporters of data in video addresses. Consequently, it is of unique focal point that this information can be sought programmed lecture video indexing. Furthermore, the majority of the current lecture speech recognition frameworks in the explored work can't attain to a sufficient recognition result. A ton of scholarly metadata will be made by using OCR and ASR framework, which opens up the substance of address recordings. To empower a sensible access for the client, the delegate keywords are further concentrated from the OCR and ASR results. For content-based video look, the look lists are made from distinctive information assets, including manual annotations, OCR and ASR keywords, worldwide metadata, etc. nowadays individuals have a tendency to create lecture videos by utilizing multi-scenes position, by which the speaker and his presentation are shown synchronously. This can be accomplished either by showing a video of the speaker and a synchronized slide record, or by applying a condition of the lecture recording framework, for example, tele-Teaching [10]. Anyplace Solution Kit such a framework which conveys two principle parts of the lecture: the principle scene of lecturers which is recorded by utilizing a video cam and the second which catches the desktop of the speaker as machine during the lecture through an edge grabber apparatus. The key advantage of the recent one for a lecturer is the adaptability. For the indexing, no additional synchronization in the middle of video and slide records is needed, and we don't have to deal with the slide position [11][12]. The paper is composed as takes after. Section 2 quickly depicts the related work.

## **2. RELATED WORK**

A surface based framework for recognizing messages in pictures was shown by K. I. Kim, K. Jung, and J.H. Kim. The system looks at the textural properties of compositions in pictures using a SVM and spots the substance areas by working CAMSHIFT on the surface characterization results. The proposed system can encourage quick content detection, despite the fact that it doesn't accept the sort of media or the shade and textural properties of writings and is moderately uncaring to image determination. It additionally functions admirably in concentrating writings from mind boggling and textured foundations and was found to create a superior execution than some different methods. Nevertheless, the texture classifier did experience issues arranging little content or content with a low differentiation [1]. Content identification in image and feature with complex foundations and layering impacts is a troublesome and testing issue. D. Chen, H. Bourlard, and J. Thiran had presented a speedy substance ID calculation dependent on help vector machine. The algorithm first incorporates the edge, and heuristic proofs to concentrate the hopeful content lines and after that recognizes these applicants by utilizing SVM. The algorithm portrayed in this paper does not utilize shade, albeit numerous frameworks additionally make utilization of color data in detecting content in color images. The principle reason is that the begin purpose of our framework, the edge proof, is basically originating from force in layered image. Changing the RGB color image to YUV shade space and performing edge detection in U or V image can without much of a stretch discover this. No worldly data is utilized as a part of our algorithm. Since content may have diverse developments in feature, content identification is typically performed before following the content among the feature frames. The algorithm exhibited here attains



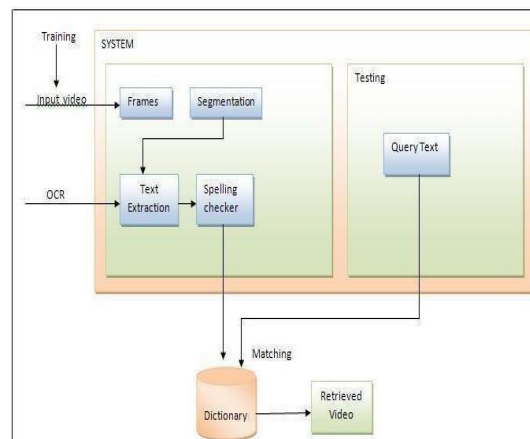
to high identification rate and additionally low false caution rates. In quick content line extraction express, this algorithm is quicker than (or equal to) other quick content identification systems, despite the fact that the entire identification methodology is more CPU serious than region-based and edge-based routines. The assessment paradigm of the identification result introduced in this paper is on the premise of right benchmark restriction. This foundation is stricter than complete spread paradigm utilized as a part of past studies. With this basis, we can quantify the identification execution correctly without needing to demonstrate the last character distinguishes result [2]. In this study, another Farsi/Arabic text detection and localization methodology is proposed. Initially, with the assistance of edge extraction, fake corners are acquired and text dimension estimation is performed. Second, by consolidating discrete cosine transform coefficients, texture intensity based picture is made. Subsequently, another Local Binary Pattern (LBP) picture is acquainted with depicts the acquired texture design. The info picture is then separated into macro squares and a few features are extricated from them and sustained into Support Vector Machine (SVM) classifier to sort them into text and nontext groups. Trial results exhibit that the proposed half and half approach can be utilized as a programmed text detection framework, which is powerful to text dimension, textual style shade and foundation unpredictability [3]. Creator exhibit a two stage framework for programmed feature text removal to identify and remove installed feature texts what's more fill-in their remaining districts by fitting information. In the feature text detection stage, text areas in each one frame are discovered through an unsupervised clustering performed on the associated parts created by the stroke width transform (SWT). Since SWT needs a precise edge map, we create a novel edge identifier which profits from the geometric peculiarities uncovered by the bandlet transform. Next, the movement examples of the text objects of each one frame are broke down to confine feature texts. The recognized feature text areas are deleted, then, the feature is restored by an inpainting plan. The proposed feature inpainting approach applies spatiotemporal geometric streams removed by bandlets to remake the missing information. A 3d volume regularization algorithm, which exploits bandlet bases in exploiting the anisotropic regularities, is acquainted with complete the inpainting scheme. The strategy does not require additional courses of action to fulfill visual consistency [4]. E. Leeuwis, M. Federico, and M. Cettolo had focused their exertion on dialect demonstrating. A LM baseline was evaluated utilizing different sorts of information, which were all defective, however utilized as a part of such a path, to the point that their qualities were highlighted and not their lacks. Utilizing the ITC-irst WSJ AM adjusted on 8h of TED preparing information, it brought about a WER [5]. D. Lee and G. G. Lee had introduced a [6] Korean talked report recovery framework or secondary school math address features which utilizes the substance data. From ASR yields and address note, they constructed the general transformed list table, the substance table and the matching table. These tables are utilized for figuring the significance score. In the study [7] by J. Glass, T.

J. Hazen, L. Hetherington, and C. Wang, they closed that the specialized dialect of scholastic addresses and absence of in-area talked information for preparing makes address interpretation a critical test that will require new systems for inferring a vocabulary and dialect model. Pong et al. [8] proposed the algorithm of segmentation in their work is focused around the differential degree of text and foundation areas. Utilizing limits they endeavor to catch the slide move. The studies depicted in Repp et al. [9] are focused around out-of-the-container business discourse different programming. Concerning such business programming, to accomplish fulfilling results for an extraordinary working space an adaption methodology is frequently needed, yet the custom expansion is once in a while conceivable.

### **3.IMPLEMENTATION DETAILS**

#### **A. System Architecture**

Following Figure 1 shows proposed system architecture. The detailed description is as follows:



**Figure1.** Proposed System Architecture Working of the system is divided into two parts:

- 1) Training Phase
- 2) Testing Phase

**Training Phase:-**We can take numbers of videos in for training process as input. At training phase initially we train videos one by one, different frames are extracted from selected video and segmentation of this frames are performed. OCR: Optical Character Recognition is applied on the extracted frames. i.e. we extract the text from each frame, after extracting text we can check this text for spelling. Correction of unmatched word can be done in this phase. We are also retrieving text from audio by applying Automatic Speech Recognition technique. Indexing is performed on Text extracted from ASR and OCR and this indexing values are further stored in dictionary. It is used to compare it with user query.

**Testing Phase:-**In this phase user enters the input query text i.e. Text for video retrieval. If input query is incorrect we can correct it by applying n gram technique. Indexing of this text is formed and these indexing values are compared with information stored in directory and at the end related videos are retrieved. A. Algorithm/ Technique All non-title text line objects are further classified into three classes: content text, key-point and footline. The classification is based on the height and the average stroke width of the text line object, which is described as follows: key-point if  $st > sh$  mean  $t > hmean$  footline if  $st < sh$  meant  $< hy$  mean =  $y_{max}$  content text otherwise; where  $smean$  and  $hmean$  denote the average stroke width and the average text line height of a slide frame, and  $y_{max}$  denotes the maximum vertical position of a text line object.

Keyword extraction and Video search

Formula for calculating TFIDF score

$$tf\ idf_{seg-internal}(kw) = \frac{1}{N} (tf\ idocr + \frac{1}{n_{type}} \sum_{i=1}^{n_{type}} (w_i + tf\ id_{asr} \cdot wasr) \dots \dots (1)$$

Where  $kw$  is the current keyword,  $tf\ id_{ocr}$  and  $tf\ id_{asr}$  denote its TFIDF score computed from OCR and ASR resource respectively,  $w$  is the weighting factor for various resources,  $n_{type}$  denotes the number of various OCR text line types.  $N$  is the number of available information resources, in which the current keyword can be found, namely the corresponding TFIDF score does not equal 0.

### A.Mathematical Model

Let the system  $S$  is represented as:

$$S = \{T, F, S, T, C, R\} \dots \dots \dots (2)$$

#### 1.Training input video

$T$  is a set of all training input videos given to the system,

$$T = \{t_1, t_2, t_3, \dots\}$$

Where,  $t_1, t_2 \dots$  are the number of input videos given.

## 2.Framing

F is a set of framing input videos which are extracted  $F = \{f_1, f_2, f_3, \dots\}$   
Where,  $f_1, f_2 \dots$  are the number of different frames.

**3.Segmentation Phase** Let, S is a set of segments,  $S = \{s_1, s_2, s_3, \dots\}$

Where,  $s_1, s_2, s_3 \dots$  are the number of different segments

## 4.Text Extraction

Let, T is a set of extracting text

$T = \{t_1, t_2, t_3, \dots\}$  Where,  $t_1, t_2, t_3 \dots$  are the number of extracted texts.

## 5.Checking for Spelling

Let, C is a set for spelling check  $C = \{c_1, c_2, c_3, \dots\}$

Where,  $c_1, c_2 \dots$  are the number of checker for spelling.

## 6.Retrieved Video Output

Let, R is a set for retrieve videos  $R = \{r_1, r_2, r_3, \dots\}$  Where,  $r_1, r_2 \dots$  are the number of various retrieved videos as output.

## 2.Experimental Setup

The system is built using Java framework (version jdk 6) on Windows platform. The Netbeans (version 6.9) is used as a development tool. The system doesn't require any specific hardware to run; any standard machine is capable of running the application.

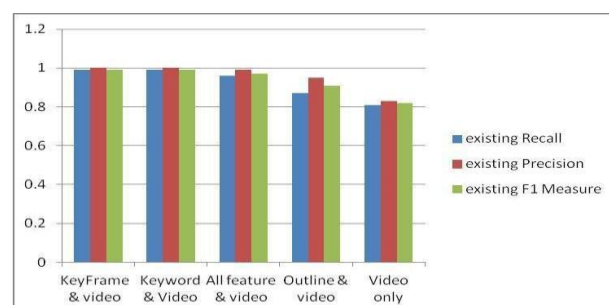
## 3.RESULTS AND DISCUSSION

**a.Dataset:-**We will use different video lectures which are done online in future. Videos lectures can also be downloaded from various standard websites available on web.

**b.Results:-**In following Table I show precision, recall and f1 measure value. Various setups are considered for that. This bar graph shows the accuracy Evaluation of Task1 of the existing system, accuracy is measured by Recall, precision and F1 Measure.

**TABLE I. TABLE FOR EXISTING SYSTEM**

Setup	Recall	Precision	F1 Measure
Key frames and video	0.99	1	0.99
Keyword and video	0.99	1	0.99
All Features and video	0.96	0.99	0.97
Outline and video	0.87	0.95	0.91
Video Only	0.81	0.83	0.82

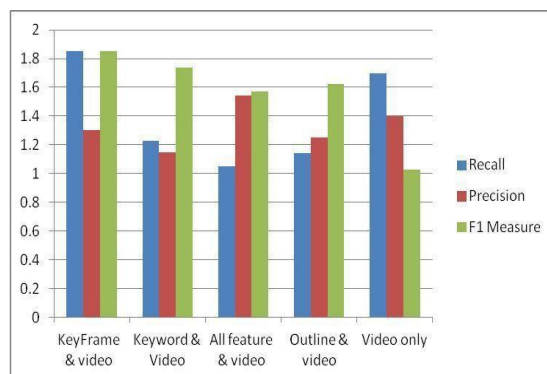


**Figure 2. Graph for Existing System**

Following Table II describes table and graph for proposed system. This bar graph shows the accuracy Evaluation of Task1 of the proposed system, accuracy is measured by Recall, precision and F1 Measure. This shows that the processing accuracy of the proposed system is greater than that of existing system.

**TABLE II. TABLE FOR PROPOSED SYSTEM**

Setup	Recall	Precision	F1 Measure
Key frames and video	1.85	1.3	1.85
Keyword and video	1.23	1.15	1.74
All Features and video	1.05	1.54	1.57
Outline and video	1.14	1.25	1.62
Video Only	1.7	1.4	1.03



**Figure 3.** Graph for Time required for Training

## 2 CONCLUSION AND FUTURE WORK

In this paper, we displayed a methodology for content based video of lecture indexing and recovery in expansive archives of lecture video. So as to check the examination theory we apply visual and additionally sound asset of address features for concentrating content based metadata consequently. A few novel indexing features have been created in an expansive video lectures portal by utilizing those metadata and a user study has been led. In our work, we use techniques for correcting errors in OCR transcriptions. This technique first generates n-gram strings for matching OCR unedited transcriptions. The n gram string contains all possibility for substrings having minimum 3 characters. The second method also contains dictionary of spelling check correction. For that MS word 2000 is used. It provides correction while spelling check. Our result proves that our technique reduces the number of false word candidates and also it avoids unauthenticated matching. This technique of video retrieval using textual queries and spoken text is useful in TV broadcasting and internet video.

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## A REVIEW OF SOLVING TRANSPORTATION PROBLEMS

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**ABSTRACT:** - While many real-world transportation problems involve mixed constraints, these difficulties are rarely addressed in the literature due to the rigor required to adequately tackle these obstacles. The suggested algorithm expands on the basic transportation problem solution. There has been a lot of focus on transportation problems with equality constraints. However, in real life, the majority of problems have mixed constraints that have a wide production of applications, including work scheduling, production, distribution, assignment problems, and investment analysis, in addition to transportation-related problems. A review of the literature revealed no comprehensive approach to discovering an optimal solution or solving more for less scenarios with mixed constraints in transportation problems.

**Keywords:** - Transportation, Algorithm, Problems, Production, Assignment.

**1.1 INTRODUCTION:-**The problem of transport is one of the subclasses of the problems of linear programming where the goal is to move diverse quantities of a homogeneous object to different birthplaces in order to obtain the maximum transportation expense. The transport models or problems are concerned primarily with the optimal (most optimal) way to transport products from different industrial sites or plants (referred to gracefully as causes) to different dealer centers (referred to as objections to requests). Anywhere there is an evolution of the products, from the manufacturing intent up to the last consumer through a variety of means of use (buyers, dealers, traders, etc.), the objective of a transport issue is to fulfill the objective requirements fully within job limiting requirements at the base conceivable costs. In both of these instances, transport problems occur. The goal of assisting top administration to

determine the number of units of a particular item is straightforward compared to the number of units transported, at the cost of distribution from source to object. There is a sort of linear programming problem that can be solved by disengaging the basic procedure called transport strategy. The technique for development will be an opportunity to solve the ideal problem. Despite the problem, the goal potential and any condition is linear and the problem can therefore be resolved.

## **1.2 TRANSPORTATION PROBLEMS**

The structure of transportation problem includes countless delivery courses from a few gracefully sources to a few interest objections. The goal is to decide the quantity of units of a thing (item or item) that ought to be delivered from an inception to an objective so as to fulfill the necessary amount of merchandise or administrations at every objective community.

It depends on gracefully and request of items transported from a few sources to the various objections. The sources from which we have to transport allude the gracefully while the objective where items show up alluded the interest.

The transportation model is an extraordinary class of linear projects. It got this name on the grounds that huge numbers of its applications include deciding how to ideally transport merchandise. Nonetheless, a portion of its significant applications (eg creation booking) really have nothing to do with transportation.

The second kind of problem is task problem. It includes such applications as allotting individuals to errands. Despite the fact that its applications give off an impression of being very not quite the same as those for the transportation, we will see the task problem can be seen as a unique sort of transportation problem.

Transportation problems consistently follow an uncommon mathematical structure in their limitations and target capacities. On account of their uncommon structure, they are solved by a methodology not the same as simplex strategy. The methodology comprises of two stages. In stage one, an achievable arrangement of the transportation problem is found. A notable stage one technique is North West corner rule. In stage two, ideal arrangement dependent on the distinguished practical arrangement is found. Stage two is fundamentally a base double technique.

## 2. REVIEW OF LITERATURE

**Samuel Chiabom Zelibe and Chika Ugwuanyi (2019)** -The transportation problem assumes an essential function in industry, trade, logistics and so forth. To augment benefit, associations are continually searching for better approaches to reduce cost and improve income. Essentially, the standard arrangement of a transportation problem is a two-phase measure. First is to locate an underlying essential achievable arrangement and furthermore, perform optimality test to improve the arrangement. This cycle is tiring and time squandering. In this study, another arrangement is presented which conquers the two-phase measure and solves the transportation problem in a one phase measure. In many cases the method had the option to give an ideal arrangement.

**Nuril Lutvi Azizah (2019)** - RASKIN / RASTRA is a programme to improve food safety for the helpless family from the family point of view. The aim of this study is to determine whether the scientific evidence can be used in transport methods to organise the expenditure on rice transport in the Sidoarjo region in detail. The procedure used to investigate the underlying monetary arrangement is the NWC (Northwest Corner) technique, refined by MODI to determine the optimum expenditure. The ideal cost is lower than Rp 85.186.040 estimated by the company from the calculation by means of transport, while Rp 87.209.690 is 750.

**M. L. Aliyu, et al (2019)** -This analysis uses a models for transporting the base cost for transporting goods from manufacturing lines to warehouses to (merchants). As well as the transportation data collected from the company BUA collection, CCNN data were used by OBU concrete transportation. The data were seen as a linear model of transportation programming and spoken of as a transport scene which was solved with the 1.0.0 adaptation of R Programming and TORA programming to establish the underlying solution and ideal solution. The results of this inquiry show that each of the three simple possible starting methods (the North-West corner, the Least Cost (least) and the Vogel Approximation method) offered different answers.

**Arup Kumar Das, et al (2019)**- In this paper we look at a group of transport problems that arise in tests and in different insight areas. There is a rare structure of the associated costs structures of these transport issues. We can see that the ideal solution of the North West corner involves the problem of rising costs. We go back to the task and present the K'önig-Egerv'ary hypothesis with a considered adaptation. Finally , in order to solve transportation problem , we propose weighted Hungarian system.



**P. Anukokila, A. Anju & B. Radhakrishnan (2019)**- In this article, we detail a compelling method for finding an ideal solution for the Type-2 Type-TI-TIFFTP problem. In comparison with current methods (gupta and anupum), the proposed approach gradually fulfils its objective. The method of trapezoidal positioning depends on the region of attendance and the non-registration portion of the numbers. The possibility of this method is shown by an illustrative model.

**K. balasubramanian, Dr. S. Subramanian (2018)**—The transport problem is a big problem that has concentrated widely in the research field of operations. It was used frequently to reintroduce distinctive real issues. The key part of this paper is to define, by means of a capacitated network, the least transport cost for certain products where the hubs requirement is flexible and the edge and edge costs are referred to as fluid number. Here, we solve the problem of transport with Robust Positioning, where fugitive interest and graceful are as trapezoidal fugitive numbers. A mathematical model will be used to address the fluctuation of the transport cost problem.

**Sri RedjekiPudjaprasetya (2018)** - This book offers a starter diagram of transport marvels. Points secured are the essential presentation on a few parts of warmth move, mass exchange, and liquid mechanics, zeroing in on issues emerging from conservation laws. Preservation laws emerge when a few (physical) amounts are monitored, for instance, mass or energy. Consequently they are much of the time experienced in a wide scope of logical and building fields. Protection laws when communicated as far as incomplete differential conditions, they are generally non-linear, and frequently they likewise concede intermittent stun wave arrangements. In applications, stun wave arrangements might be found as bores in waterways, sonic blast, or gridlock. This book contains a thorough inclusion of mathematical strategies and investigation, just as hypothetical turn of events, which is indispensable to the comprehension and usage of uses. This book would be appropriate for cutting edge college understudies in arithmetic and computational sciences.

**Akilbasha, et al (2017)** -Another method in particular, unpleasant cut entirety method for solving completely harsh whole number span transportation problems is proposed. The solution got by the proposed method gives an arrangement having least unit delivering unpleasant expense for the given problem. The estimations of choice unpleasant factors and harsh target work for the given problem acquired by the unpleasant cut total method are harsh whole number spans. Mathematical model is introduced to comprehend the solution system of the proposed method.

**Dr. Shraddha Mishra (2017)** -The major and most fruitful applications of Optimaization relate to the problem of transport (tp), which is an exceptional class of linear programming ( lp) of operating research (or). The transport issue is seen as a relevant point of view focused in a wide range of activities, including in the field of science. Consequently, some genuine issues have been used for replication. The main goal of methods of arranging the transport problems is to limit the cost or the time of transport.

**Ali Ebrahimnejad (2016)** -Transport challenges have different logistics applications and are flexibly related to lower costs. In the present circumstances, due to wild conditions, the limits of transport problems can not be understood. Here we suggest a further approach to solve fuzzy transport problems (FTPs) in which non-negative LR-level fluffy numbers are used to talk about transport expenses and requirements. The FTP is changed to four transport problems solved with standard simple calculations of transport. Two implementation models address the improvements of the proposed approach over current methods. The results show that the approach proposed is simpler than current written methods and more computationally efficient.

**M. M. Ahmed, et al (2016)** - The primary requirement for an ideal response to transportation problems is to find a simple, achievable solution. In this post, we suggest a different approach to find a fundamental solution for the problems of transport. The method is also shown with mathematical models.

**Anuradha Dhanapal (2016)**-The transport question feeds the financial and social revolutions, is the cardinal of research activities and Board science. This paper provides a limited analysis of the mathematical models of various transport problems.

**3. NEEDS OF THE STUDY:-**To choose the highway a development leader needs to embrace (managing the request where he/she should visit better places). To choose the demand during which various exercises performed on one and furthermore a similar facility will be concerned. Because of transportation show, the gracefully sum will be less or more than the solicitation. So likewise the undertaking show, the quantity of occupations will be identical to, less or more than the quantity of machines/individuals open. In all of these cases, the simplex methodology for LPP will be grasped, yet transportation and undertaking models are more practical, less dull and less complex than the LPP.

#### **4. SCOPE OF THE STUDY**

The transportation problem is a special class of linear programming problem, which deals with shipping commodities from source to destinations. The objective of the transportation

problem is to determine the shipping schedule that minimize that total shipping cost while satisfying supply and demand limits.

Transportation problem deals with the problem of how to plan production and transportation in such an industry given several plants at different location and larger number of customers of their products. The transportation problem received this name because many of its applications involve in determining how to optimally transport goods. Transportation problem is a logistical problem for organizations especially for manufacturing and transport companies. This method is a useful tool in decision-making and process of allocating problem in these organizations. The transportation problem deals with the distribution of goods from several points, such as factories often known as sources, to a number of points of demand, such as warehouses, often known as destinations. Each source is able to supply a fixed number of units of products, usually called the capacity or availability, and each destination has a fixed demand, usually known as requirement. So this study is to Finding an initial basic feasible solution is the prime requirement to obtain an optimal solution for the transportation problems. In this work, a new approach is proposed to find an initial basic feasible solution for the transportation problems. The method is also illustrated with numerical examples

## **5. LIMITATION OF THE STUDY**

For the unbalanced problem, with in excess of three dummy rows or columns, the proposed algorithm will be smidgen complex to acquire the optimal solution. The proposed algorithms will be unpredictable for a large scope industry and it will need computer language to get the optimal solution.

## **6. METHODOLOGY**

The Management will be used for finding an optimal solution of transportation problem with equity limitations.

### **6.1 DATA SOURCES**

This study would consider the proposed model of transport of the products produced to the consumer (key distributors). The accumulated knowledge is modelled on the transport model Linear Programming and addresses the transport problem as a stage and illuminates it with the computer software solver, thereby producing an optimal solution. Internet and mathematical books from the Mumbai Library and Mathematics branch will be the source of knowledge for the industry. Problems of the various true circumstances are modelled as the

linear programme model of assignment and type of transport and relate to the linear programming or the problem of assignment and transport as a scene.

## 6.2 MATHEMATICAL FORMULATION

Assumed a company has  $m$  warehouses and  $n$  retail outlets. A solitary product will be transported from the warehouses to the outlets. Each warehouse will have a given degree of flexibility, and every outlet has a given degree of interest. We will additionally give the transportation cost between each pair of warehouse and outlet, and these costs are thought to be linear. All the more unequivocally, the presumptions are:

- The absolute supply of the products from warehouse  $i = a_i$ , where  $i = 1, 2, 3, \dots, m$
- The absolute Demand of the products at the outlet  $j = b_j$ , where  $j = 1, 2, 3, \dots, n$ .

The cost of sending one unit of the product from warehouse  $i$  to outlet  $j$  is equivalent to  $C_{ij}$ , where  $i = 1, 2, 3, \dots, m$  and  $j = 1, 2, 3, \dots, n$ . The complete cost of a shipment will be linear in size of shipment.

## 6.3 MATHEMATICAL FORM OF THE TRANSPORTATION PROBLEM

The transport issue is seen using a linear mathematical programming model and is generally presented in a transport scene. In a succinct tabular format, with all the significant constraints, the model for a transport problem is discussed. A transport table (Average transportation TP is referred to in a standard matrix structure) in which accessibility ( $a_i$ ) is shown in the extreme right column on every source and the destination necessities ( $b_i$ ) are shown in the base line in which every cell speaks to a single path. In the upper right corner of the cell is the shipping unit cost ( $c_{ij}$ ), and the measurement of the materials shipped is placed in the focus of the cell. The transport scene definitely can communicate the limitations of supply and demand and shipping costs between each point of demand and supply.

Let us accept that there will be  $m$  sources and  $n$  destinations. Let  $s_i$  be the supply at sources  $i$ ,  $d_j$  be the demand at destination  $j$ ,  $C_{ij}$  be the unit transportation cost from source  $i$  to destination  $j$  and  $X_{ij}$  be the quantity of units moved from source  $i$  to destination  $j$ .

At that point the transportation problem will be communicated mathematically as:

$$\sum_{i=1}^m \sum_{j=1}^n C_{ij} X_{ij} \quad (1)$$

Subject to the limitations:

$$\sum_{j=1}^n X_{ij} \leq S_i \text{ for all } i \quad (2)$$

$$\sum_{i=1}^m X_{ij} \leq d_i \text{ for all } j \quad (3)$$

$$X_{ij} \geq 0 \quad (4)$$

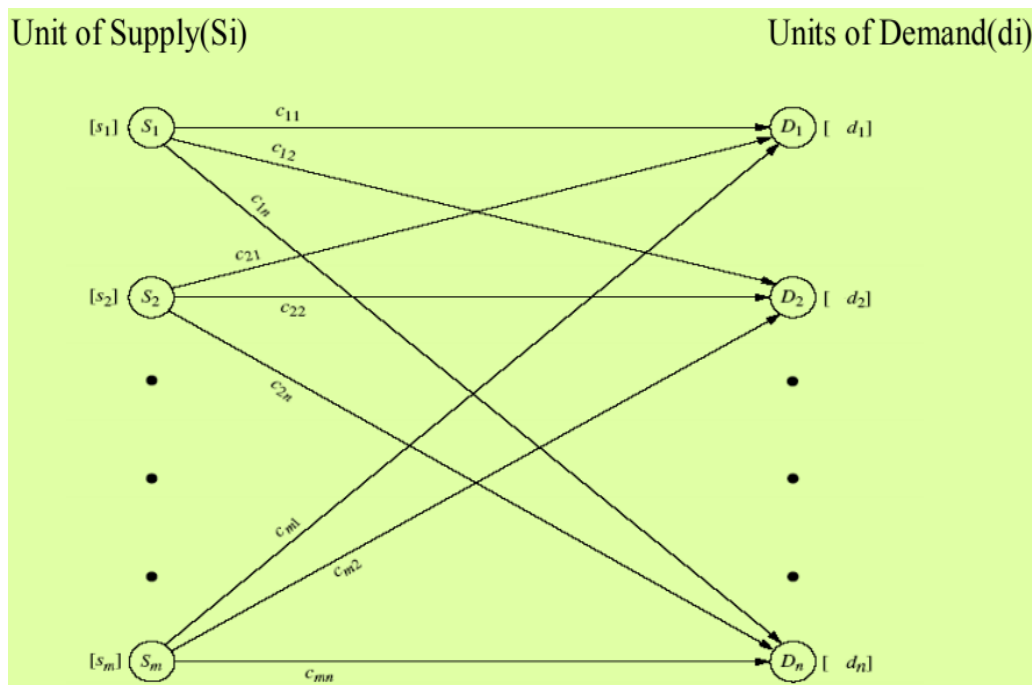
Transportation problem will expressly speak to by the accompanying transportation table.

**Table 1: Standard Transportation**

Origin (i)	Destination(j)				Supply (a <sub>i</sub> )
	1	2	...	N	
1	X <sub>11</sub> C <sub>11</sub>	X <sub>12</sub> C <sub>12</sub>	.....	X <sub>1n</sub> C <sub>1n</sub>	a <sub>1</sub>
2	X <sub>21</sub> C <sub>21</sub>	X <sub>22</sub> C <sub>22</sub>	...	X <sub>2n</sub> C <sub>2n</sub>	a <sub>2</sub>
...	...	...	...	...	...
m	X <sub>m1</sub> C <sub>m1</sub>	X <sub>m2</sub> C <sub>m2</sub>	...	X <sub>mn</sub> C <sub>mn</sub>	a <sub>m</sub>
<b>Demand(b<sub>j</sub>)</b>	<b>b<sub>1</sub></b>	<b>b<sub>2</sub></b>	<b>...</b>	<b>b<sub>n</sub></b>	<b>Σa<sub>i</sub> = Σb<sub>j</sub></b>

**6.4 TRANSPORTATION PROBLEMS' NETWORK REPRESENTATION**

Graphically, transportation problem will regularly envisioned as a network with m source hubs, n sink hubs, and a lot of m.n "directed arcs" This is portrayed in Fig 1



**Figure 1: Transportation Problems' Network Representation**

### Balanced Transportation Problem

We will say that the transportation problem will be considered to be balanced if:

$$\sum_{i=1}^m s_i = \sum_{j=1}^n d_j \quad (5)$$

### Unbalanced Transportation Problem

We will say that the Transportation problem will be considered to be unbalanced if

$$\sum_{i=1}^m s_i \neq \sum_{j=1}^n d_j \quad (6)$$

There are two cases

Case (i)

$$\sum_{i=1}^m s_i > \sum_{j=1}^n d_j \quad (7)$$

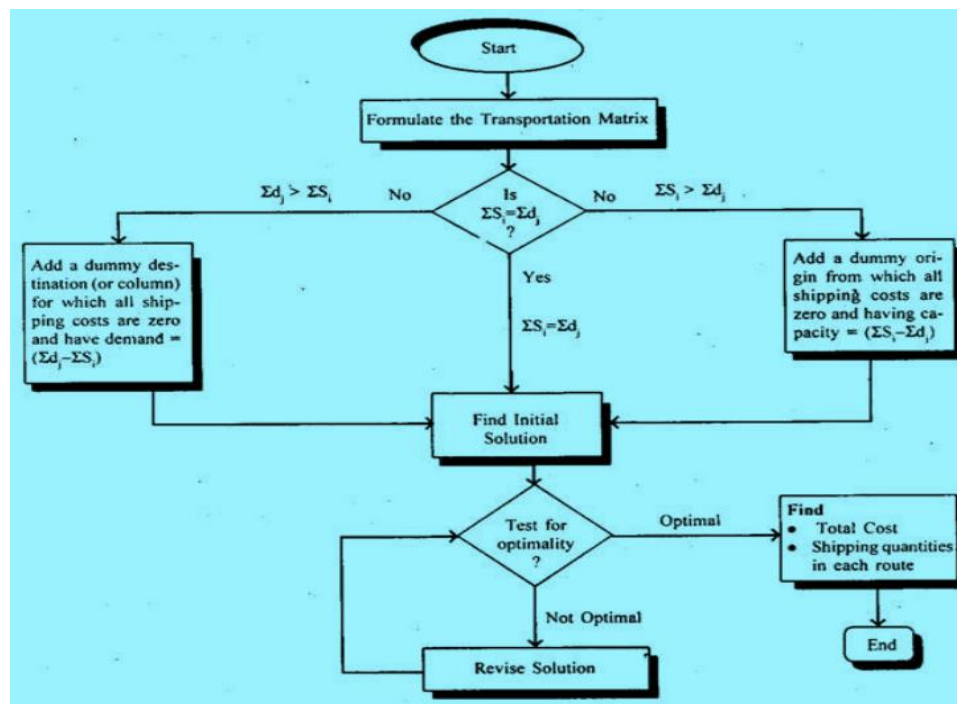
Case (ii)

$$\sum_{i=1}^m s_i < \sum_{j=1}^n d_j \quad (8)$$

Present the dummy variable in the transportation table, and the cost related with the starting point will set equivalent to zero or one.

### 6.5 SOLUTION FOR A TRANSPORTATION PROBLEM

- First the problem will be defined as transportation matrix.
- Check climate will have a balance transportation model?
- If not balance add a dummy to either the supply or the demand to balance the transportation model.
- Find the underlying solution of the transportation problem.
- Check whether the solution will be enhanced? In the event that the solution isn't streamline go to 4.
- When optimal solution will be acquired
- We process the absolute transportation cost and furthermore shipped the individual amount demand to its course.



**Figure 2: flow chart of the transportation problem**

**6.6 METHODS USED:-**The unmistakably famous technique will be utilized in solving this is from MODI and stepping stone strategy. North West Corner Rule, Matrix Minimum (Least Cost) Method will have been used in this study.

**7. CONCLUSION:-**We proposed a heuristic technique for handling mixed-restrictions transport problems when there is a more for less dilemma. The proposed method approaches the problem at a lower level and offers a step-by-step strategy for locating an MFL solution, if one exists. For some, this is the best solution. The presence of MFL in transportation problems is not prevalent; it is frequently significant for decision makers, and previous documentation has demonstrated the possibility of determining cases in which the paradoxical situation exists. Managers can utilize the proposed approach, which is simple to understand and apply, to solve a variety of distribution problems with mixed constraints.

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## **Current Status of Research in Artificial Intelligence field**

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**Abstract:** Research is a form of studying analyzing the existing work and learning for the enhancement and development of ideas so that the ideas will lead to help society for rise in every possible level of progress with success. When the research in the field of computer or information technology the leads are taken by artificial intelligence, deep learning and data mining.This field contribute in diverse industries like healthcare industry having different application in the form of smart robots or in the marketing in the form of chatbots.

**Keywords :**Artificial Intelligence,deep learning, datamining, robots, chatbots.

### **I Introduction**

Artificial Intelligence

### **II Artificial Intelligence : Chatbots**

The artificial intelligence is also seen in market survey where chatbots are used to see, study and conclude from the customer likes dislikes, expectation and habits of buying and getting the conclusion. These chatbots are having brain and algorithms based on artificial intelligence. As basic of marketing chatbots is the continuous service to the customer on reality grounds.The survey helps to findout all checks from customer side.It helps to find out the target in market, customer needs,customer expectation and service fulfillment.The beneficial companies may be of any sector like financial,pharma, law or education.Chatbots act as a communicating device which makes people comfortable and easy to share their actions, likes, dislikes and expectation about respective product.Chatbots are following rule on that basis they go for asking questions and get experience of users thus leading to the growth in number of information due to easy and fast information. Still there is fear of wrong input from customer creating difficulty in mining information.[2].The healthcare is taking help of chatbots as a healthcare assistant to the normal busy people who neglect little issue

arise in their health. So, the healthcare assistant which is working on artificial intelligence and artificial neural network gives suggestion for common diseases and ask human to visit doctor or recommend the exercise, tracking exercise or the work routine which should be followed for good health. Chatbot or the personal assistant work on artificial intelligence rules. There are some areas people don't have common essential information about good health and fitness which will be tried by chatbots. As people spend more time on messaging so chatbots reside on social messaging and send messages to the user or alerts for health thus increasing chatbot self-accuracy.[7]

### **III Artificial Intelligence for various diseases**

Within health issues heart attack is causing greater mortality than any other disease. Patient can feel disturbed due to the untrained front attenders or health workers in hospital. The stethoscope which is used together the heart rate of patient can be made advanced with the help of artificial intelligence, cloud and mobile. It gives predetection of valvular heart abnormalities such as arrhythmias and murmurs. So mobile app at front end and cloud at backend with the help of artificial Intelligence is taken into consideration.[1] Melanoma is a skin cancer which detection and surgery decision in early stage can save the life of patient. But the early diagnosis inaccuracy and delay in surgery can restrict the disease growth and end of life of patient. That's why artificial intelligence algorithm which is convolution neural network is used to reach the accuracy of the prediction of melanoma. Computer or technical vision have proved useful in detection and classification of objects. Due to less available images of skin data and the noise and interference training of data is little difficult. With the use of deep convolutional neural network accuracy is achieved on independent sample.[5] In the healthcare industry one more disease is majorly need concern of technology is Alzheimer disease in which person cannot perform his basic task properly. The MRI scan which is required to diagnose critically may be not performed due to fatigue, cognitive biases, distraction. Artificial Intelligence along with pattern recognition will lead to the stable diagnosis in this disease. Initial stages of Alzheimer disease are detected due to deep learning. Healthcare techniques are expected to be fast, reliable and reproducible thereby helping the healthcare experts for decision making and diagnosis. That's why there is need of smart diagnostic system with accurate results.[3]

**IV Artificial Intelligence with communications through sensors & data mining:-**The machines which are developed through artificial intelligence are called smart devices as they

are working strongly and fast to achieve the target but if they are communication so speed should be fast i.e 5G speed of transmission of data. In healthcare , if medical practitioner is not there so a robot nurse should perform the task of monitoring health of patient perfectly. In healthcare 4.0 the communication between machine to machine or device to device face issues in transmission of data due to 4G limitation which are overcome by 5G that is fifth generation communication in assistance with artificial intelligence and Internet of things. The combination of healthcare 5.0 in the form of wireless communication with artificial intelligence and interconnected devices gives automated and accurate results in remote healthcare applications which also include remote patient monitoring and treatment and robotics surgery system.[4] There is a concept of mobile telemedicine with mobile artificial intelligence in health care when there is need of mass screening of population which is remote, rural and hard to access. Artificial intelligence in association with cloud create the solution for mass screening with accuracy and overcome the insufficiency. It is structured as artificial medical intelligence in communication with the satellite through satellite channel using fourth generation communication. Thoracic disease are considered for detection ,the patients fluorogram images which is taken through X ray need to be analyzed by the radiologist in less time, so the fluorogram is passed to the respective radiologist through satellite and cloud service and as a response to the communication radiologist give the answer as normal or abnormal.[6]

**Sensors:-**Ambient Intelligence is having combination of embedded sensors and conventional objects which easily adapt the environment of user transparently. Am I (Ambient Intelligence) is helpful in healthcare industries as a low cost solution and also avoiding the security risk, scalability and other problems. It verifies the condition of health and provides solution with respect to the disease. Thus, Am I assist the healthcare professional with accuracy. The technology is parted in two ways body area network and the mesh sensors. The body sensors can be planted on clothes checking the blood pressure, heart rate, temperature etc, which given as input on doctor's site. The mesh sensor collects data and predict from that about disease.[8] Healthcare Information system invited the involvement of artificial intelligence in the prominent field thus affecting positively the life of human being in regards of health. The rules and fuzzy logic implemented in deep learning have given vision to healthcare industries. Exploring new ideas in the field of healthcare and preparing roadmap for that idea is done.[9]. In healthcare ,artificial intelligence and the knowledge of human being is applied to give benefit. The brain which is supplying intuition to the AI does satisfy

the uncertainty of prediction is need to be settled properly at less binary and useful for future.[10]In healthcare application's do well by using implanted sensors, visual images, sound and combination of artificial intelligence technologies. The major output are predetection of chronic diseases, understanding the individual behavior and relative treatment, care on basis of DNA thus managing quality of life.[11].

**Data mining:-**Data mining is the extraction of meaningful data from the huge database can help to predict meaningful results. The data mining along with artificial intelligence gives healthcare industry a artificial immune system based on classification algorithm and normal classification algorithm. Thus AIS (Artificial Immune system) is increasing efficiency of treatment and enhancing better customer and healthcare management avoiding the frauds and abuse in healthcare industries.[12]

**V Conclusion:-**Artificial Intelligence is started from roots in healthcare industry by developing different applications for various diseases that may be heart attack, skin disease etc. By doing collaboration with the communication, data mining, deep learning a well-defined system are on development stage .The main goal and role of Artificial intelligence in healthcare is to reduce the workload by increasing the perfection, accuracy in the diagnosis phase and leading to the immediate rescue of patients from the chronic diseases and thus by increasing the faith of human being on training the machine which is artificial Intelligence by human, for human and of human brain.

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## PONGAMIA PINNATA-AN OVERVIEW

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**ABSTRACT:-**Nowadays Ayurvedic medicines or herbal medicines are most commonly used for various diseases compared to other systems of medicines. And also the effects are higher and side effects are less. In phyto therapy or phyto medicine, the plant or plant part is used to make the medicine for healing process during illness and diseases. It is also known as herbal medicine. The plants and the parts of the plants containing different types of constituents or phyto constituents which all are used for various categories. The major phyto constituents are belonging to alkaloids, glycosides, flavanoids, fixed oils, and carbohydrates etc. This review outlines the medical and energy aspects of *Pongamia pinnata* along with the various constituents present in the plant parts with its confirmation tests.

**Key words-** Ayurvedic medicines, Phyto constituents, Pongamia pinnata, Phytotherapy

**INTRODUCTION:-**The ‘Pongam Tree’ is known as one of the richest and brightest trees of India. The name ‘Pongamia’ has derived from Tamil name, ‘pinnata’ that is the ‘Pinnata leaves’. The *Pongamia pinnata* plant is under Leguminosae (Fabaceae) family with Papilionaceae sub family.<sup>1</sup>

This is fast-growing medium sized plant having an average height of 30–40 feet. Traditionally, different parts of *P. pinnata* such as bark, leaves, seeds, roots, flowers and stem have been utilized in the native medicine systems<sup>2</sup>. The flowers of this plant have been possess anti-hyperglycemic and anti-lipid peroxidation properties. Its bark is used in piles; leaves are used for rheumatic pain, wound healing while the seeds are used for hypertension, bronchitis, whooping cough, skin diseases and rheumatic arthritis. Roots are used for cleaning gums, teeth, and ulcers and also effective in gonorrhoea.<sup>3</sup>

*Pongamia pinnata* has a varied habitat distribution and can grow in a wide range of conditions. It can grow in various types of soil like salty, alkaline, heavy clay, sandy, stony, and waterlogged soils and also shows high tolerance against drought bearing temperature up to 50°C.

‘Karanj’ or ‘Papar’ or ‘Kanji’ are the different names of this plant in different languages.

The ‘Pongam Tree’ is a medium-sized tree that grows rapidly, being cultivated in a large number of gardens and along the countless roads in India and is becoming the one of the most admired city trees.<sup>4</sup> The plant is with five white petals lined with pink or violet color. The flowers have loose and brown colored minute stem and with cup shaped calyx. The bark is grey-brown in color and the blossoms are mass along the stem and are 1.3cm in length. The leaves having 15cm-30 cm length with five, seven or nine oval-shaped leaflets with pointed tips. The stems rise from the upper angle of the leaves. The fruits are some timber-like pods that grow about in length. They are dark grey in color and get matured just before the next lot of new leaves appears. It is one of the few ‘Nitrogen Fixing Trees’<sup>5</sup>.

**VERNACULAR NAMES**

Sanskrit	: Ghrtakarauja, Karanjaka, Naktahva, Naktamala
Bengali	: Dahara karanja, Karanja, Natakaranja
Assamese	: Korach
Kannada	: Honge, Hulagilu
Kashmiri	: --
Marathi	: Karanja
Gujrati	: Kanaji, Kanajo
Punjabi	: Karanj
Telugu	: Ganuga, Kanugu
Hindi	: Karuaini, Dithouri
Oriya	: Karanja
Tamil	: Pungai, Pongana
Urdu	: Karanj
Malayalam	: Pungu, Ungu, Unu, Avittals <sup>6</sup>

Figure1&2 showing pongamia pinnata tree and leaves

**CHEMICAL CONSTITUENTS**

The main constituents present in the Pongamia pinnata plant are flavanoids, alkaloids, glycosides, terpenoids and saponins etc.<sup>8</sup>The seeds of the plant consist of Six compounds (two sterols, three sterol derivatives and one disaccharide) together with eight fatty acids (three saturated and five unsaturated) .Also contain Karanjin, pongamol, pongagalabrone, pongapin, pinnatin and kanjone. The leaves and stem of the plant consist of several flavones and chalcone derivatives such as pongone, galbone, Pongalabol, pongagallone A and B.Also isolated five structurally unusual flavonoids pongamones A-E, along with 16 known flavanoid metabolites. Pongamia pinnata fruits order three new furanoflavanoid glycosides,

pongamosides A-C and a new flavanol glucoside, pongamoside D<sup>9</sup>. The various chemical tests used for the detection of phytoconstituents are as follows

### **Detection of Alkaloids**

#### **Mayer's test**

To the filtrate add Mayer's reagent, formation of yellow cream precipitate indicates the presence of alkaloids.

#### **Wagner's test**

To the filtrate add Wagner's reagent, formation of brown or reddish brown precipitate indicates the presence of alkaloidSS

### **Detection of Flavanoid**

#### **Lead acetate test**

To the extract add few drops of 10% lead acetate solution; formation of yellow precipitate indicates the presence of flavanoids

#### **Shinoda test**

To the extract add few fragments of magnesium metal followed by drop wise addition of con.HCl, formation of magenta color indicates the presence of flavanoid

### **Detection of Amino acid and Protein**

#### **Million's test**

To the extract add 2ml of million's reagent, white precipitate turned in to red on heating indicates the presence.

#### **Biuret test**

To the extract add 1ml of 10% NaOH solution .heated and add a drop of 0.7% CuSO<sub>4</sub> solution, formation of purplish violet color indicates the presence of protein.

#### **Ninhydrin test**

To the extract add 0.25% ninhydrin reagent, formation of blue color indicates the presence of amino acid.

### **Detection of Glycoside**

#### **Modified Borntrager's test**

To the extract add FeCl<sub>3</sub>, heated to boiling on a water bath about 5 minutes. The mixture cooled and shaken with equal volume of benzene. The benzene layer separated and treated with half of its volume of ammonia solution. Formation of rose pink or cherry red color indicates the presence of anthranol glycoside.

#### **Legal's test**



To the extract add sodium nitroprusside in pyridine and methanolic alkali, formation of pink to red color indicates the presence of cardiac glycoside.

#### **Liebermann-Burchard's test**

The extract mixed with chloroform, filter. To the filtrate add few drops of acetic anhydride, boiled and cooled. Conc. sulfuric acid was added through the sides of the test tube. Brown or pink color ring at the junction indicates the presence of terpenoids, saponines and glycosides.

#### **Keller Killani test**

0.5 g dried extract dissolved in 2ml glacial acetic acid containing one drop of FeCl<sub>3</sub> solution. This was then under laid with 1ml con. Sulfuric acid. A brown ring obtained at the junction of two liquids indicates the presence of deoxy sugar.

#### **Detection of Saponin**

##### **Froth's test**

The extract diluted with 20 ml distilled water, shaken for 15 minutes in a graduated cylinder. A layer of foam measuring about 1 cm indicates the presence of saponin.

#### **Detection of Phenolic compounds and Tannins**

##### **Ferric chloride test**

To the extract add few drops of neutral ferric chloride, formation of bluish black color indicates the presence of phenolic compounds

##### **Gelatin test**

To the extract add 1% gelatin solution containing sodium chloride, formation of white precipitate indicates the presence of tannins.<sup>10</sup>

#### **PHARMACOLOGICAL ACTIVITIES**

##### **Anti-inflammatory Activity**

It has been reported that 70% ethanolic extract of *P. pinnata* leaves has potent anti-inflammatory activity against different phases (acute, sub acute and chronic) of inflammation without side effect on gastric mucosa

##### **Anti-plasmodial Activity**

It has been reported that *P. pinnata* is one of the plant, which shows anti-plasmodial activity against *Plasmodium falciparum*.

##### **Antioxidant and Anti-hyperammonemic Activity**

It has been observed that effect of *P. pinnata* leaf extract on circulatory lipid per oxidation and antioxidant status was evaluated in ammonium chloride-induced hyper ammonium rats

##### **Anti-diarrheal Activity**

It has been evaluated that anti-microbial effect of crude decoction of dried leaves of *P. pinnata* and also evaluated its effect on production and action of enterotoxins

### Anti-ulcer Activity

It has been reported that methanolic extract of *P. pinnata* roots showed significant protection against aspirin and 4 h PL, but not against ethanol-induced ulceration. It showed tendency to decrease acetic acid-induced ulcer after 10-day treatment.<sup>11</sup>

**CONCLUSION:-**From the beginning, plants have more and more applications in the treatment of different varieties of diseases. The preparations containing concentrated forms of different plant parts are available in the market and these preparations have high demand among traditional practitioners and patients. The oil formulated from *Pongamia pinnata* is widely available and employed by practitioner of natural health for treatment of rheumatism and healing processes. In the traditional systems of medicines, such as Ayurveda and Unani, the *P. pinnata* plant is used for anti-inflammatory, anti-plasmodial, anti-nociceptive, anti-hyperglycemic, anti-lipidperoxidative, anti-diarrhoeal, anti-ulcer, antihyperammonemic, antioxidant and wound healing processes. Its oil is a source of biodiesel. It has also alternative source of energy, which is renewable, safe and non-pollutant.

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## CLOUD COMPUTING AND ITS SALIENT FEATURES

**DILEEP SINGH**

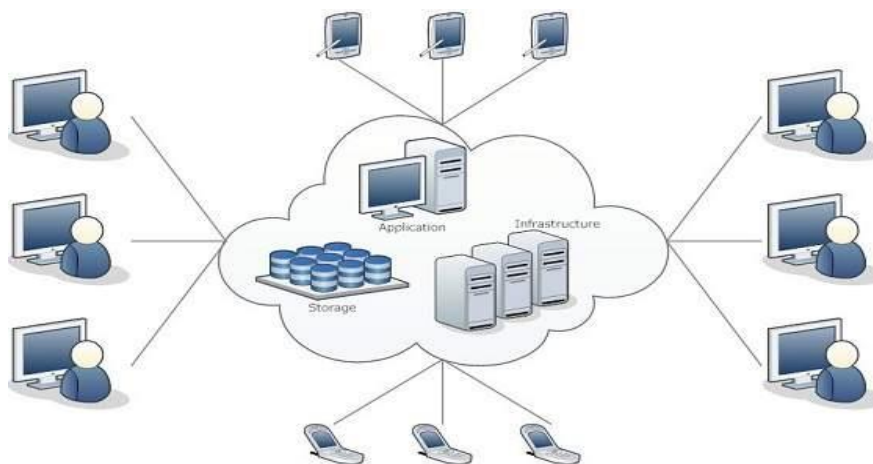
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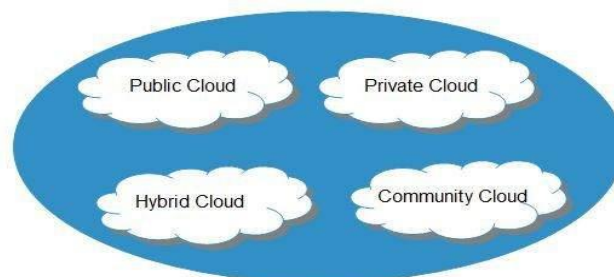
**ABSTRACT:-**Cloud computing has recently emerged as a new paradigm for hosting and delivering services over the Internet. Cloud computing is attractive to business owners as it eliminates the requirement for users to plan ahead for provisioning, and allows enterprises to start from the small and increase resources only when there is a rise in service demand. However, despite the fact that cloud computing offers huge opportunities to the IT industry, the development of Cloud computing technology is currently at its infancy, with many issues still to be addressed. In this paper, we define cloud computing, its types, benifites, Virtualization.

**KEYWORDS:-**Cloud Computing, Virtualization, Public Cloud, Private Cloud, Hybrid Cloud

**INTRODUCTION:-**The term **Cloud** refers to a **Network** or **Internet**. In other words, we can say that Cloud is something, which is present at remote location. Cloud can provide services over public and private networks, i.e., WAN, LAN or VPN. Cloud Computing refers to **manipulating, configuring, and accessing** the hardware and software resources remotely. It offers online data storage, infrastructure, and application.



Cloud can have any of the four types of access: Public, Private, Hybrid, and Community.



**PUBLIC CLOUD:-**The **public cloud** allows systems and services to be easily accessible to the general public. Public cloud may be less secure because of its openness.

**PRIVATE CLOUD:-**The **private cloud** allows systems and services to be accessible within an organization. It is more secured because of its private nature.

**COMMUNITY CLOUD:-**The **community cloud** allows systems and services to be accessible by a group of organizations.

**HYBRID CLOUD:-**The **hybrid cloud** is a mixture of public and private cloud, in which the critical activities are performed using private cloud while the non-critical activities are performed using public cloud.

**BENEFITS:-**Cloud Computing has numerous advantages. Some of them are listed below

- One can access applications as utilities, over the Internet.
- One can manipulate and configure the applications online at any time.
- It does not require installing software to access or manipulating cloud application.
- Cloud Computing offers online development and deployment tools, programming runtime environment through **PaaS model**.
- Cloud resources are available over the network in a manner that provide platform independent access to any type of clients.
- Cloud Computing offers **on-demand self-service**. The resources can be used without interaction with cloud service provider.
- Cloud Computing is highly cost effective because it operates at high efficiency with optimum utilization. It just requires an Internet connection

**CHARACTERISTICS:**

**CLOUD COMPUTING PROVIDES SEVERAL SALIENT FEATURES THAT ARE:**

**MULTI-TENANCY:-**In a cloud environment, services owned by multiple providers are co-located in a single data center. The performance and management issues of these services are shared among service providers and the infrastructure provider. The layered architecture of cloud computing provides a natural division of responsibilities: the owner of each layer only needs to focus on the specific objectives associated with this layer. However, multi-tenancy also introduces difficulties in understanding and managing the interactions among various stakeholders.

**SHARED RESOURCE POOLING:-**The infrastructure provider offers a pool of computing resources that can be dynamically assigned to multiple resource consumers. Such dynamic resource assignment capability provides much flexibility to infrastructure providers for managing their own resource usage and operating costs. For instance, an IaaS provider can leverage VM migration technology to attain a high degree of server consolidation, hence maximizing resource utilization while minimizing cost such as power consumption and cooling.

**GEO-DISTRIBUTION AND UBIQUITOUS NETWORK ACCESS:-**Clouds are generally accessible through the Internet and use the Internet as a service delivery network. Hence any device with Internet connectivity, be it a mobile phone, a PDA or a laptop, is able to access cloud services. Additionally, to achieve high network performance and localization, many of today's clouds consist of data centers located at many Locations around the globe. A service provider can easily leverage geo-diversity to achieve maximum service utility.

**SERVICE ORIENTED:-**As mentioned previously, cloud computing adopts a service-driven operating model. Hence it places a strong emphasis on service management. In a cloud, each

IaaS, PaaS and SaaS provider offers its service according to the Service Level Agreement (SLA) negotiated with its customers. SLA assurance is therefore a critical objective of every provider.

**DYNAMIC RESOURCE PROVISIONING:-**One of the key features of cloud computing is that computing resources can be obtained and released on the fly. Compared to the traditional model that provisions resources according to peak demand, dynamic resource provisioning allows service providers to acquire resources based on the current demand, which can considerably lower the operating cost.

**SELF-ORGANIZING:-**Since resources can be allocated or deal located on-demand, service providers are empowered to manage their resource consumption according to their own needs. Furthermore, the automated resource management feature yields high agility that enables service providers to respond quickly to rapid changes in service demand such as the flash crowd effect.

**UTILITY-BASED PRICING:-**Cloud computing employs a payer-use pricing model. The exact pricing scheme may vary from service to service. For example, a SaaS provider may rent a virtual machine from an IaaS provider on a per-hour basis. On the other hand, a SaaS provider that provides on-demand customer relationship management (CRM) may charge its customers based on the number of clients it serves(e.g., Sales force). Utility-based pricing lowers service operating cost as it charges customers on a per-use basis. However, it also introduces complexities in controlling the operating cost. In this perspective, companies like V Kernel provide software to help cloud customers understand, analyze and cut down the unnecessary cost on resource consumption.

#### **VIRTUALIZATION:**

**Virtualization** is a technique, which allows to share single physical instance of an application or resource among multiple organizations or tenants. It does this by assigning a logical name to a physical resource and providing a pointer to that physical resource when demanded.

**CONCLUSION:-**Cloud computing has recently emerged as a compelling paradigm for managing and delivering services over the Internet. The rise of cloud computing is rapidly changing the land scape of information technology, and ultimately turning the long-held promise of utility computing into a reality.

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## Cost Benefit of a Rice Plant

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**Abstract:**-The Rice Plant basically comprises of four subsystems specifically Cleaning, Husking, Separation, and Elevator. Cleaning has two sub-units. A single repairman is available 24\*7. Availability of rice plant is determined with the assistance of RPGT and accessibility of the arrangement of rice plant for various values of repair and failure rates of subsystems is additionally determined. Specific cases are produced to consider the effect of failure/repair rates on MTSF, availability, expected number of server visits and server of busy period. Profit optimization is additionally talked about. System behavior is discussed with the assistance of graphs and tables.

**Keywords:**-Availability, RPGT, MTSF, Steady State.

### 1. Introduction:

Rice plant is the most established and the biggest agro handling industry. Rice is the fundamental food crop and being a tropical plant, flourishes easily in warm and sticky environment. India is the second biggest maker of rice on the planet close to China, and is likewise one of the main exporters of rice on the planet market. Indian Basmati rice has been a top pick among worldwide rice purchasers. Kumar, A. and Garg, D.[2019] have talked about the reliability technology and its applications. Kumar, A., et al. [2018] have examined conduct examination of a bread making framework. Kumar, A., et al. [2017] has considered the system of behavior analysis in urea fertilizer. Kumar, A., et. al. [2017] has analyzed the modeling and benefit analysis of a edible oil refinery industry. The framework under idea contains four unmistakable subsystems explicitly Crusher (C), Filter (D), pot unit (E), Neutralizer unit (F). Sub unit 'C' have parts in equal and various units have portion in arrangement, so if at any rate one segments fall flat in unit 'C' than the system works in decreased/diminished yield limit and various subunits misses the mark when at any rate one section bombs then that unit misses the mark making the whole structure a failed state. Rajbala et al. [2019] discussed the manufacturing plant using RPGT, markov birth-death process and ODE-45 strategy. Kumar, A., et al. [2019] examined the numerical displaying and social examination of a washing unit in paper factory. A Washing System Consists of three subsystems, for example, Screen (C), Cleaner (D) and Decker (E). The Screen (C) having two units in arrangement. The cleaner (D) having m units equal. The Decker (E) having one fundamental units and a backup. Besides, these papers successfully utilize the regenerative point method and convey the steady disappointment and general fix rates. Kumar, A., et. al. [2018] paper dissected the sensitivity analysis of 3:4:: Good framework plant is made with a lone worker which includes four non-indistinguishable units in which crucial unit can work in decreased state as a result of fractional disappointment. Kumar, A., et. al. [2019] investigated the sensitivity analysis of a cold standby framework with need for preventive support

comprises two indistinguishable units with worker disappointment utilizing RPGT. Rajbala, et. al. [2019] have examined the system modeling and examination: a case study EAEP manufacturing plant. This paper further presents the time dependent and consistent state accessibility when failure and repair rates are variable and steady individually. The mathematical problem along these lines created has additionally been solved systematically and numerically for few decisions of the failure/repair rates of subsystems. Fuzzy concept is utilized to decide disappointment conditions of a unit. Assuming the worker report, that unit isn't repairable; it is supplanted by another one. Specific cases are produced to consider the effect of failure/repair rates on MTSF, availability, expected number of server visits and server of busy period. Profit optimization is additionally talked about.

**2. Assumptions and Notations**

A single repairman is available 24\*7. The framework is argued under steady state conditions. pr/pf: Probability/ transition probability factor.

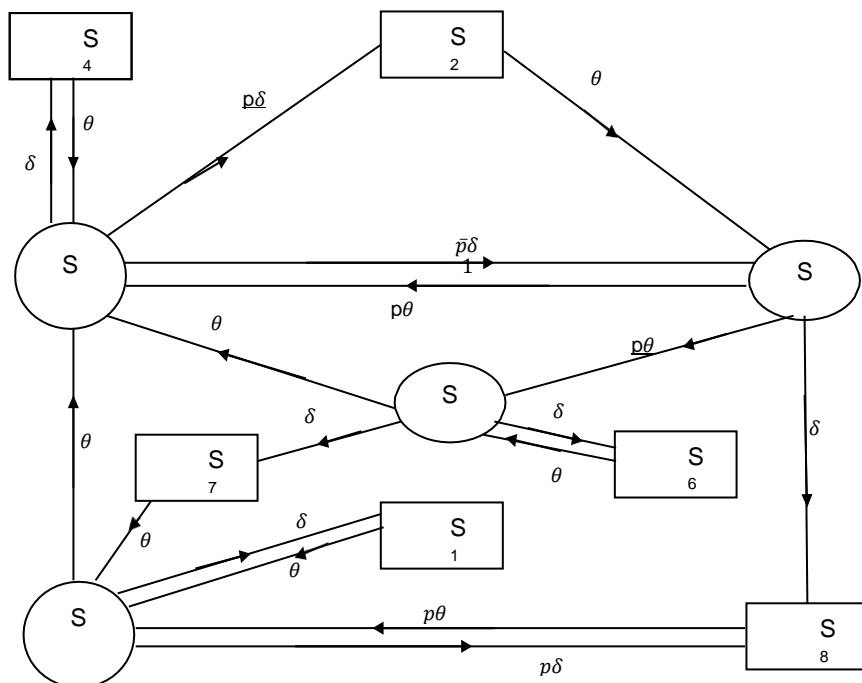
$\lambda_i$ : Failure rates

$\theta_i$ : Repair rates

**1. Transition Diagram of the System**

Following the above assumptions and notations, the transition diagram of the system is as shown in Figure 1. The system can be in any of the following states with respect to the above symbol.

S1 = E(C)HS; S2 = e(C)Hs; S3 = e(C)HS; S4 = E(C)hS; S5 = E(C)Hs S6 = e(C)hS; S7 = EcHs; S8 = ecHS; S9 = EcHS; S10 = EchS



**1. Transition Probabilities and Mean Sojourn Times: Table**

**2. 2: Transition Probabilities**

$q_{i,j}(t)$	$p_{i,j}=q_{i,j}^*(0)$
$q_{1,2}=p\delta_1 e^{-(p\delta_1+\bar{p}\delta_1+\delta_3)t}$	$p_{1,2}=p\delta_1/(p\delta_1+\bar{p}\delta_1+\delta_3)$
$q_{1,3}=\bar{p}\delta_1 e^{-(p\delta_1+\bar{p}\delta_1+\delta_3)t}$	$p_{1,3}=\bar{p}\delta_1/(p\delta_1+\bar{p}\delta_1+\delta_3)$
$q_{1,4}=\delta_3 e^{-(p\delta_1+\bar{p}\delta_1+\delta_3)t}$	$p_{1,4}=\delta_3/(p\delta_1+\bar{p}\delta_1+\delta_3)$
$q_{2,1}=\bar{p}\delta_1 e^{-(\bar{p}\delta_1+\theta_4)t}$	$p_{2,1}=\bar{p}\delta_1/(\bar{p}\delta_1+\theta_4)$
$q_{2,3}=\theta_4 e^{-(\bar{p}\delta_1+\theta_4)t}$	$p_{2,3}=\theta_4/(\bar{p}\delta_1+\theta_4)$
$q_{3,1}=p\theta_1 e^{-(p\theta_1+\bar{p}\theta_1+\delta_2)t}$	$p_{3,1}=p\theta_1/(p\theta_1+\bar{p}\theta_1+\delta_2)$
$q_{3,5}=\bar{p}\theta_1 e^{-(p\theta_1+\bar{p}\theta_1+\delta_2)t}$	$p_{3,5}=\bar{p}\theta_1/(p\theta_1+\bar{p}\theta_1+\delta_2)$
$q_{3,8}=\delta_2 e^{-(p\theta_1+\bar{p}\theta_1+\delta_2)t}$	$p_{3,8}=\delta_2/(p\theta_1+\bar{p}\theta_1+\delta_2)$
$q_{4,1}=\theta_3 e^{-(\theta_3)t}$	$p_{4,1}=1$
$q_{5,1}=\theta_4 e^{-(\theta_4+\delta_3+\delta_2)t}$	$p_{5,1}=\theta_4/(\theta_4+\delta_3+\delta_2)$
$q_{5,6}=\delta_3 e^{-(\theta_4+\delta_3+\delta_2)t}$	$p_{5,6}=\delta_3/(\theta_4+\delta_3+\delta_2)$
$q_{5,7}=\delta_2 e^{-(\theta_4+\delta_3+\delta_2)t}$	$p_{5,7}=\delta_2/(\theta_4+\delta_3+\delta_2)$
$q_{6,5}=\theta_3 e^{-(\theta_3)t}$	$p_{6,5}=1$
$q_{7,9}=\theta_4 e^{-(\theta_4)t}$	$p_{7,9}=1$
$q_{8,9}=p\delta_3 e^{-(p\delta_3)t}$	$p_{8,9}=1$
$q_{9,1}=\theta_2 e^{-(\theta_2+p\delta_1+\delta_3)t}$	$p_{9,1}=\theta_2/(\theta_2+p\delta_1+\delta_3)$
$q_{9,8}=p\delta_1 e^{-(\theta_2+p\delta_1+\delta_3)t}$	$p_{9,8}=p\delta_1/(\theta_2+p\delta_1+\delta_3)$
$q_{9,10}=\delta_3 e^{-(\theta_2+p\delta_1+\delta_3)t}$	$p_{9,10}=\delta_3/(\theta_2+p\delta_1+\delta_3)$
$q_{10,9}=\theta_3 e^{-(\theta_3)t}$	$p_{10,9}=1$

**Table 3: Mean Sojourn Times**

$R_i(t)$	$\mu_i=R_i^*(0)$
$R_1(t) = e^{-(p\delta_1+\bar{p}\delta_1+\delta_3)t}$	$\mu_1=1/(p\delta_1+\bar{p}\delta_1+\delta_3)$
$R_2(t) = e^{-(\bar{p}\delta_1+\theta_4)t}$	$\mu_2=1/(\bar{p}\delta_1+\theta_4)$
$R_3(t) = e^{-(p\theta_1+\bar{p}\theta_1+\delta_2)t}$	$\mu_3=1/(p\theta_1+\bar{p}\theta_1+\delta_2)$
$R_4(t) = e^{-(\theta_3)t}$	$\mu_4=1/(\theta_3)$
$R_5(t) = e^{-(\theta_4+\delta_3+\delta_2)t}$	$\mu_5=1/(\theta_4+\delta_3+\delta_2)$
$R_6(t) = e^{-(\theta_3)t}$	$\mu_6=1/(\theta_3)$
$R_7(t) = e^{-(\theta_4)t}$	$\mu_7=1/(\theta_4)$



$R8(t) = e^{-(p\delta_3)t}$	$\mu_8=1/(p\delta_3)$
$R9(t) = e^{-(\theta_2+p\delta_1+\delta_3)t}$	$\mu_9=1/(\theta_2 + p\delta_1 + \delta_3)$
$R10(t) = e^{-(\theta_3)t}$	$\mu_{10}=1/(\theta_3)$

Table – 6

### 3. Transition Probability Factors: -

The mean time to system failure and all the key parameters of the system (under steady state conditions) are evaluated by using Regenerative Point Graphical Technique (RPGT) and using '0' as the base state of the system as under: -

$$V_{1,1} = 1 \text{ (Verified)}$$

$$V_{1,2} = (1, 2)$$

### 4. Evaluation of Parameter

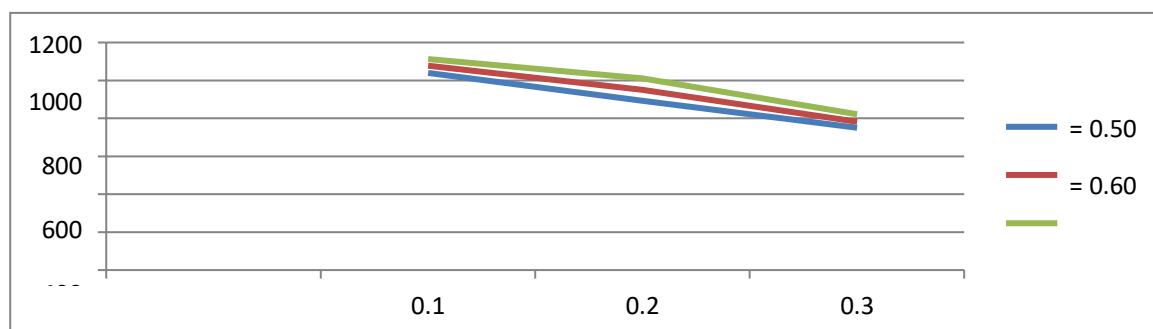
**Profit Function (P0):** The system can be done by utilized profit function

$$P_0 = D_1A_0 - (D_2B_0 + D_3V_0) = D_1A_0 - D_2B_0 - D_3V_0,$$

Taking  $D_1 = 1200$ ;  $D_2 = 100$ ;  $D_3 = 200$ , we have

**Table : 3 Profit Function**

$\delta\theta$	0.50	0.60	0.70
0.10	1040	1078	1113
0.20	893	950	1011
0.30	751	783	822



**Figure:2 Profit Function**

**Conclusion:-**The table 3 and figure 2, it is shows that when failure rates increases the profit function decrease and repair rates increases then the profit functions increases.

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## **DISTRIBUTED MOBILE AND STATIC WIRELESS SENSOR NETWORK**

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### **Abstract**

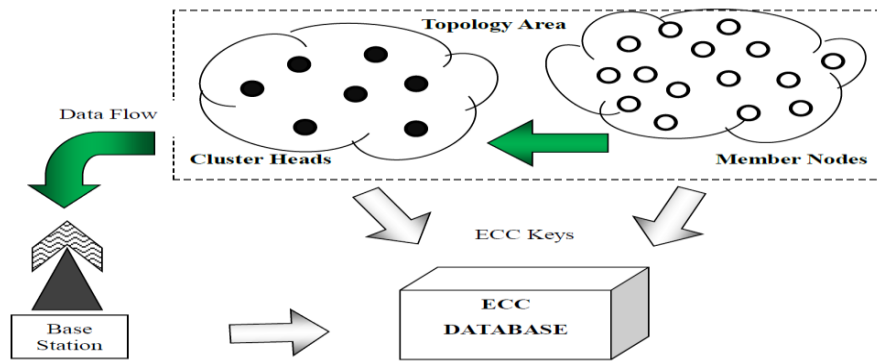
Wireless Sensor Network is connecting to the nodes and infrastructure. Networks with lesser security mechanisms are prone to higher rate of attacks. A number of attacks have been launched on the wireless networks; the most difficult of all the attacks is the node replication attacks. It consumes more time to detect the clone node. This paper describes about the detection and prevention of node replication attacks in static distributed wireless sensor networks. To prevent the replicated node, an IECC (Inclusive Elliptical Curve Cryptography) key approach is proposed for detecting node replication attacks in static distributed wireless sensor networks.

**I. INTRODUCTION:-**The node replication attack is one of the notorious attacks that can be easily launched by adversaries in wireless sensor networks. It is more difficult to detect the replicas in mobile sensor networks because of their node mobility. Some existing schemes identified replicated attacks by sensing mobile nodes with identical ID but different locations. This work is inspired by the distributed replica detection Scheme HIP-HOP [1] and efficient hybrid detection method [2]. In the existing method, if the speed is low, then the detection accuracy rate is less and the communication cost is high [4]. To increase the detection accuracy and to increase the communication cost, a History of Neighbor Node (HNN) method is proposed. The proposed HNN approach detects the replicated node locally and globally. The HNN method detection accuracy is high in any speed limit. To prevent the node from replication attack a Lightweight Security Verification (LSV) method is proposed, and compared with the existing system [6], the proposed prevention rate is high.

**III DISTRIBUTED STATIC WSN:-**WSN have better vulnerable attacks, only for replication attack can be removed. In this section, an IECC method is proposed to prevent the replicated node in static distributed WSN. In WSN mainly three types of node-to-node communication [10]:

- Member to Cluster Head (Member – CH)
- Cluster Head to Cluster Head (CH – CH)
- Cluster Head to Base Station (CH – BS)

A part from this WSN has different type of network, Member-to-Member. It is very effective and secured method for sensor network as an intact architecture. In a single database communication system IECC incorporates to analyze the node.



**Figure .1 Architecture of IECC in WSN**

The communication process indicate the node, the database to generate ECC key, the key will be formed in a cluster  $m$  CHs and CH to produce the  $n$  members of each cluster. Due to the clustering base to observe the ECC key for security system[9] .

### ALGORITHM OF IECC APPROACH

Input:  $N$  nodes; grouped into  $n$  CHs; each CH with  $n$  members

Output: member nodes from Replicated nodes (RA( $n$ )) or from CHs

(RA( $m$ ))

Initialize  $\rightarrow$  BS;

Pilot signal  $\rightarrow$  generate ECC for all  $n \in N$

BS  $\leftarrow$  initiate Secure\_ECC\_Clustering(node\_ids of  $N$ )

For ( $i = 0$  to  $n$ )

{

CH  $\leftarrow$  CH\_list[ $i$ ];

For each CH to  $n$

{

PF( $n$ )  $\leftarrow$  Performance\_Node( $n$ );

Check PF( $n$ ) < PFTHRESHOLD

If

{

true

}

{

```
break;
}
else
{
Checking_ECC_keys(CH and n);
Collect data from CH to n;
}
}
Exit 0;
```

## **DISTRIBUTED MOBILE WIRELESS SENSOR NETWORK**

### **LIGHT SECURITY VERIFICATION (LSV)**

A sensor node moves from one place to another place with the confidential data. The node may be captured by attacker[8] , collects all the confidential information and place the clone node of the captured node. In order to secure the nodes from replication attack a LSV method is proposed. The overview of the proposed work is discussed in the Figure .2.

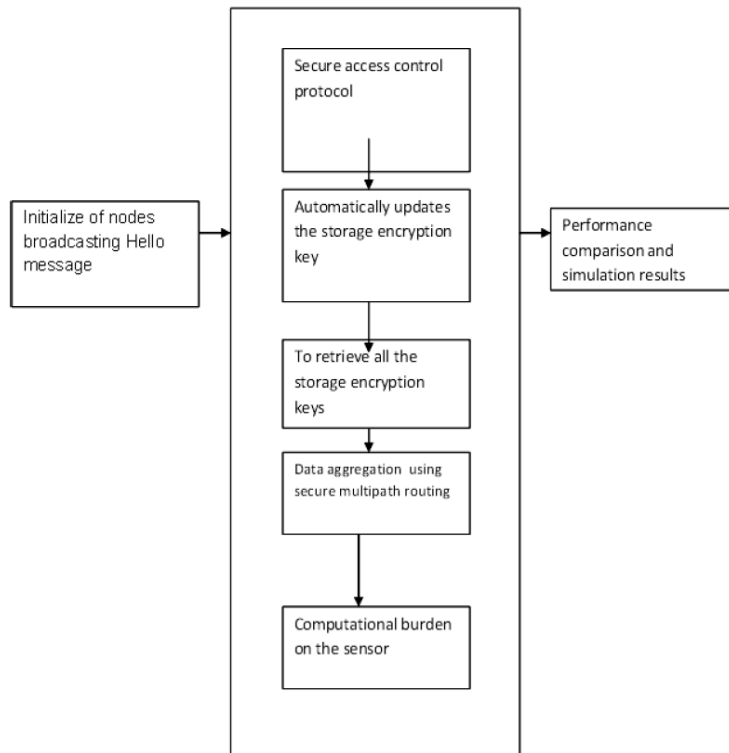
### **ALGORITHM OF LSV**

Verification of\_ LSV(receiver and sender)

```
{
Sender sends RREQ to receiver;
Receiver measures the RREQ packets
Receiver prepares RREP and eliminates VKey
Receiver sends the VKey along with RREP
If VKey authentic
{
Return true
}
Else
{
Return false
}
```

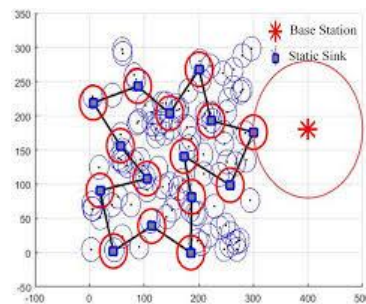
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**OVERVIEW OF LSV APPROACH:**

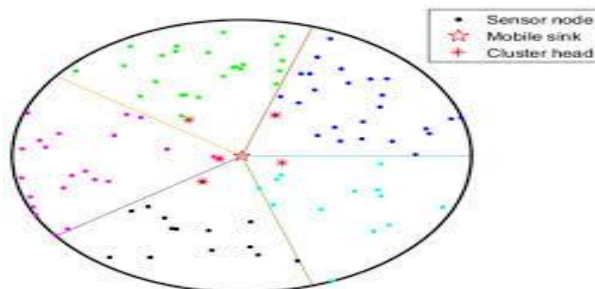


**Figure.2 Overview of LSV Approach**

**IV RESULT**



Multiple mobile link in a wireless sensor network



Energy effective in LSV in wireless sensor network

## V CONCLUSION

In this paper we discussed classification of detection mechanisms for replication attack in static and mobile. The proposed LSV allows the user to easily implement different types of deployment algorithms for various applications of WSN. Although it is dedicated to be used with detect the replicas in mobile sensor networks, it can be easily adjusted in order to be used with other WSN platforms. A detailed classification of the state-of-the-art on node replication attack resiliency protocols, schemes and algorithms for both static as well as mobile WSNs is presented. The purpose of complete guide for researchers working in the domain of security of WSNs as well as for WSNs application developers to incorporate the best suited replica detection strategy to their applications.

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## FORMULATION AND EVALUATION OF TRANSDERMAL PATCH OF DANAZOLE

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**Abstract:-** Transdermal drug delivery has made an important contribution to medical practice. It is a medicated patch that delivers a specific amount of medication through the skin into the blood stream. An advantage of a transdermal drug delivery route over other types of medication delivery is that the patch provides a controlled release of the medication into the patient, usually through either a porous membrane covering a reservoir of medication or through body heat melting thin layers of medication embedded in the adhesive. The present investigation was aimed to formulate transdermal films of non steroidal anti-inflammatory drug, Danazole using mercury substrate method and evaluated for physicochemical parameters like thickness, weight variation, moisture uptake, moisture content, folding endurance, and drug content values. Three transdermal patches were prepared using different concentrations of ethyl cellulose. It was concluded that as the concentration of polymer increases the thickness of patch, weight uniformity and folding endurance increases. Percentage moisture content and percentage moisture uptake decreases with increase in polymer concentration.

**Keywords:-** Transdermal; Inflammation: Skin; NSAID; Polytehylene glycol.

**Introduction:-** Formulation studies involve developing properties of the drugs which is both stable and acceptable to the patient. Formulation studies then consider such factors as particle size, polymorphism, pH and solubility as well as then can influence bioavailability and hence activity of drug. Pharmaceutical formulation is the process in which different chemical substance, including the active drug are combined to produce final medicinal product. Transdermal patch generally refers to topical application delivers agents to healthy intact skin either for localized treatment of tissues underlying the skin or for systemic therapy. Transdermal Patch offers many advantages over the conventional dosage forms or controlled release oral systems. Transdermal patch provides constant blood levels, avoids first pass metabolism, increased patient compliance, and avoids dose dumping<sup>1,2</sup>. The application of transdermal delivery to a wider range of drugs is limited due to the significant barrier to penetration across the skin which is allied primarily with the outermost stratum corneum layer of the epidermis. Formulation on skin can be classified into two categories according to the target site of the action. One has systemic action after drug uptake from the cutaneous micro vascular network and other exhibits local effects in the skin. Transdermal drug delivery can closely mimics the slow intravenous infusion without its potential hazards and also offer another most important advantage in allowing the patient to terminate the drug therapy by simply removing the patch at desired time if toxicity develops<sup>3</sup>.

NSAID (Non-steroidal anti-inflammatory drugs) are mostly used for the preparation of transdermal patches for the treatment of inflammation or pain. The NSAID patches are safer and convenient than its oral form. Patient with rheumatism received different NSAID tablets. The side effects like stomach bleeding, increased acidity, ulcers are avoided by using transdermal patches of NSAID. The analgesic patch of NSAID may be used on the site of bruise, sprain or strain. These patch when applied topically in the form of transdermal patch, without reaching higher plasma drug concentrations the drug penetrate the skin, subcutaneous fatty tissue, and muscle in amounts sufficient to exert local therapeutic effects. Hence



NSAIDs offer the advantage of local, enhanced drug delivery to affected tissues with a reduced incidence of systemic adverse events. In Rheumatoid Arthritis patients are advised to take the NSAIDs for prolong period but the side effects related to systemic toxicity and GIT irritation are the main drawbacks of NSAIDs drugs<sup>4,5</sup>.

Danazole is non steroidal anti-inflammatory agent, widely used in musculoskeletal disorders, arthritis, toothache, etc., for symptomatic relief of pain and inflammation. The drug undergoes substantial hepatic first-pass metabolism and only about 50% of administered dose reaches systemic circulation. In Rheumatoid Arthritis patients are advised to take the NSAIDs for prolong period but the side effects such as systemic toxicity, GIT irritation, nausea, vomiting, gastric erosion, headache are the main drawbacks of Danazole. Because of its short biological half-life and frequent administration, it is considered as a suitable candidate to formulate it into a sustained release matrix type transdermal patch system. Main objective of study is to develop transdermal patch of Danazole to achieve more patient compliance, to reduce the dosing frequency, to enhance the release rate of drug for quick onset of action, to avoid the oral administration of drug to omit the GIT related bioavailability problems and to improve local availability of drug to site of action in arthritis<sup>6</sup>.

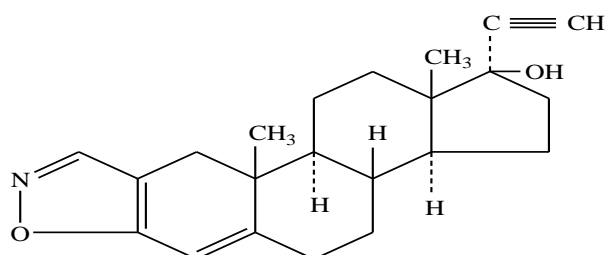
Danazole is used to treat endometriosis (a condition in which the type of tissue that lines the uterus grows in other areas of the body and causes infertility, pain before and during menstrual periods, pain during and after sexual activity, and heavy or irregular bleeding). Danazol is also used to treat fibrocystic breast disease (swollen, tender breasts with noncancerous lumps) when other treatments are not successful. Danazol is also used to prevent attacks in people with hereditary angioedema (inherited condition that causes episodes of swelling in the hands, meet, face, airway or intestines). Danazol is in a class of medications called androgenic hormones. It works to treat endometriosis by shrinking the displaced tissue to the uterus. It works to treat fibrocystic breast disease by blocking the release of hormones that cause the breast pain and lumps. It works to treat hereditary angioedema by increasing the amount of a natural substance in the body. Danazol is also sometimes used to treat idiopathic thrombocytopenic purpura (ITP; an ongoing condition that may cause easy bruising or bleeding due to an abnormally low number of platelets in the blood).

Danazol is a synthetic steroid derived from ethisterone. It is a white to pale yellow crystalline powder, practically insoluble or insoluble in water, and sparingly soluble in alcohol. Chemically, danazol is 17 $\beta$ -Pregna-2,4-dien-20-yno [2,3-d]-isoxazol-17-ol. The molecular formula is C<sub>22</sub>H<sub>27</sub>NO<sub>2</sub>. It has a molecular weight of 337.46 and the following structural formula:

#### **Inactive Ingredients**

Corn Starch, Lactose, Magnesium Stearate, Talc. Capsules 50 mg, 100 mg, 200 mg contain D & C Yellow #10, FD&C Red #40, Gelatin, Silicon Dioxide, Sodium Lauryl Sulfate, Titanium Dioxide. The 50 mg and 200 mg capsules also contain D&C Red #28.

Danocrine brand of danazole suppress the pituitary-ovarian axis. This suppression is probably a combination of depressed hypothalamic-pituitary response to lowered estrogen production, the alteration of sex steroid metabolism and interaction of danazol with sex hormone receptors. The only other demonstrable hormonal effect is weak androgenic activity. Danocrine depresses the output of both follicle-stimulating hormone (FSH) and luteinizing hormone (LH).



## Materials and Methods

### Materials

All the chemicals used in this research were of standard pharmaceutical grade. Danazole was procured as a Central Drug Research Institute, Lucknow, U.P. Ethyl Cellulose (Titan biotech Ltd., Bhiwadi, Rajasthan), PEG-400 (SD Fine chemicals, Mumbai), Dibutylphthalate (Nice Chemicals, Cochin), Methanol (Nice Chemicals, Cochin) and chloroform (SD Fine chemicals, Mumbai) were of analytical reagent grade.

### Methods

Ethyl Cellulose was used for the formulation of Transdermal Patch. Polyethylene glycol (PEG 400) was used as a plasticizer. Dibutylphthalate is used as penetration enhancer. The polymer was dissolved in chloroform: methanol (1:1) solvent. The drug was dispersed uniformly in the viscous solution with continuous stirring. The resulting mass was poured into leveled mercury surface in a Petri dish covered with inverted funnel. The Petri dish was left undisturbed at room temperature for one day. The patch was obtained intact by slowly lifting from the Petri dish and transdermal patches were cut into radius of 2cm<sup>2</sup> <sup>7-9</sup> (Table-1).

Table-1: Formulation Design

Ingredients	F1	F2	F3
Danazole (mg)	5	5	5
Ethyl Cellulose (mg)	100	150	200
PEG-400 (ml)	0.8	0.8	0.8
Dibutyl phthalate (ml)	0.8	0.8	0.8
Chloroform: Methanol	0.91	0.91	0.91

## Evaluation and Characterization

### Thickness of patch

The thickness of each patch was measured by using screw gauge at five different positions of the patch and the average was calculated<sup>10</sup>.

### Weight uniformity

Patches sizes of 2cm radius (4cm diameter) was cut. The weights of five patches were taken and the weight variation was calculated<sup>11</sup>.

### Folding endurance

A patch of 2cm radius (4cm diameter) was cut evenly and repeatedly folded at the same place till it brakes. The numbers of times the film was folded at the same place without breaking give the value of the folding endurance<sup>12,13</sup>.

### Percentage moisture content

The prepared films were weighed individually and kept in a desiccators containing fuse calcium chloride at room temperature for 24h. After 24h, the films were reweighed and determined the percentage moisture content from the mentioned formula<sup>14,15</sup>.

### Percentage moisture uptake

The weighed films were kept in desiccators at room temperature for 24h containing saturated solution of potassium chloride in order to maintain 84% RH. After 24h, the films were

reweighed and determined the percentage moisture uptake from the below mentioned formula<sup>16,17</sup>.

### Drug content

A specified area of patch was dissolved in a phosphate buffer solution. The content was stirred to dissolve the film. The content was transferred to a volumetric flask. The absorbance of the solution was measured at wavelength 284nm and determines the drug content<sup>18</sup>.

### Results and Discussion

The spectrum of UV was analyzed by UV/V is spectroscopy and  $\lambda_{\max}$  found to be 267nm at pH 5.8 with  $R^2$  value of 0.9856. (Table 2-4) (Figure-1). It can be concluded that as the concentration of polymer increases the thickness of patch, weight uniformity, folding endurance increases. Percentage moisture content and percentage moisture uptake and drug release decreases with increase in polymer concentration.

Table-2: Preparation of Standard Curve of Danazole at pH 5.8.

Concentration mcg/ml	Absorbance
2	0.001
4	0.039
6	0.099
8	0.178
10	0.247

Table-3: Evaluation of Danazole Transdermal Patch

Formulation Code	Thickness (mm)	Weight Uniformity (gm)	Folding Endurance
F1	0.512 ± 0.03	0.298 ± 0.02	120.0 ± 2.6
F2	0.514 ± 0.06	0.352 ± 0.04	112.0 ± 2.7
F3	0.518 ± 0.06	0.402 ± 0.02	99.0 ± 2.06

Table-4: Evaluation of Danazole Transdermal Patch

Formulation Code	% Moisture Content	% Moisture Uptake	Drug Content (mg)
F1	6.16 ± 0.12	5.85 ± 0.22	80.64 ± 0.25
F2	5.25 ± 0.23	4.83 ± 0.26	74.18 ± 0.32
F3	4.22 ± 0.66	4.65 ± 0.45	68.43 ± 0.50

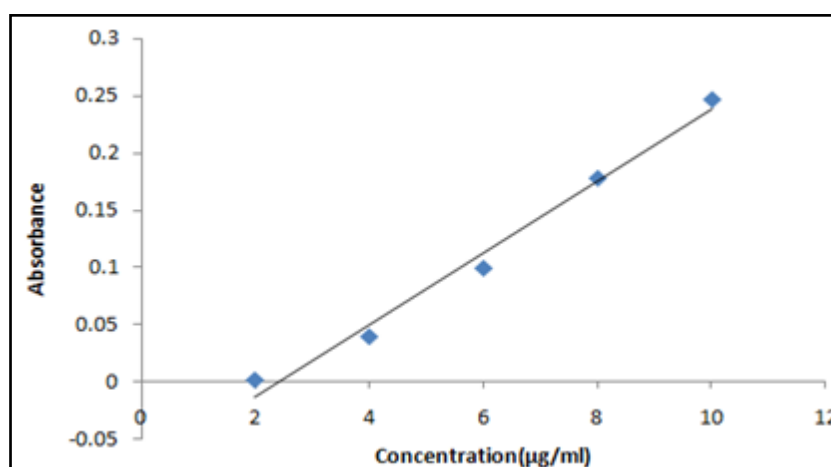


Figure-1: Standard curve of Danazole

**Conclusion:-**The transdermal patch of Danazole was prepared successfully by using different concentrations of ethyl cellulose by solvent casting method. The present work can further be proceeding with in-vivo study on healthy animals to evaluate the pharmacokinetic profile. Danazole may cause liver damage with abdominal bleeding in people who take danazole for a long time. It also cause increased pressure of the fluid in side the skull.

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## A Descriptive study on Cardiovascular complication and risk factors in the Urban Areas of Delhi and NCR amidst Covid-19

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**Abstract** :-This study aims to understand the prevalence rate, in accordance with age, sex and frequency of prevalence of risk factors of Cardio Vascular Complications. The Subjects were (n=88) in number (50 females and 38 male) residing in the urban areas of Delhi and NCR and covered target populations aged 40+ years to 80 years. The study design included a retrospective risk factor survey with the help of a self-constructed structured questionnaire with a total of 14 questions. The following information were gathered by using the questionnaire like demographic characteristics such as age, sex, etc., lifestyle-related factors such as dietary habits, smoking, activity level, stress level, cholesterol level etc. and the health status of the individual and any history or family history related to heart disease, stroke, hypertension and diabetes. The study indicates the prevalence of the 5 high-risk factors with a strong positive correlation and were high blood pressure, obesity, diabetes, high cholesterol and stress. It was noted that many participants were having more than five risk factors that would pave the way to Cardiovascular Complications. Out of the total participants, 54% of participants experienced the stress of the highest score. The study was conducted during the pandemic period due to COVID-19 and may act as an extraneous variable.

**Keywords:** - Cardiovascular Disease, Urban population, Delhi and NCR, Complication-Risk factors, COVID-19

**Introduction:**-Cardiovascular diseases (CVDs) are a classification of disorders related to the heart and blood vessels that are caused due to numerous risk factors. According to the World Health Organization (WHO) in 2021, CVDs are one of the primary causes of mortality in India as well as globally. WHO also estimated that within a decade, India would face a loss of nearly \$237 billion due to loss of productivity and spending on health care. Even the capital of India, being an urban metropolitan city, has been displaying a higher prevalence in CVDs than in rural areas with risk factors involved such as hypertension and diabetes mellitus, obesity, and family history etc (Prabhakaran, 2016). It is important to understand the trend in the data and understand more about the CVDs.

Earlier it was affecting only the adults but it has also now affecting the adolescents as well. In recent times due to the Coronavirus disease -19 (COVID-19), there has been a shift in the statistics. There have been different complication and death arising due to COVID-19, and it also disturbs the blood pressure which may have a direct and indirect effect on patient with CVDs. As per the data, there is a high prevalence of CVDs as well as “*Cardiovascular comorbidities are common in patients with COVID-19 and such patients are at higher risk of morbidity and mortality*” (Clerkin et al, 2020).

This research sheds light on the current scenario as well as brings out the descriptive data of people residing in Delhi and NCR for the risk factors and complications of CVDs during the pandemic situation.

## Review of Literature

As per the research by Global Burden of Diseases in 2010, an estimate of nearly a quarter (24.8%) of all deaths in India are attributable to CVD. The prevalence of ischemic heart disease in 1960 in urban India was 2% and increased 7-fold to  $\approx 14\%$  by 2013 (Prabhakaran, 2016). This drastic shift and increase in scale have continued up to date. Similarly, a cohort study conducted with 161,942 participants in India in 2002-2007 stated that CVD was the leading cause of mortality. A similar result was reported through a Cause-of-death survey in India. (Prabhakaran, 2018). In a study it was found that there are over 300 existing (conventional) risk factors for CVDs have been discovered mostly fall into two broad categories: 1) modifiable (if treated and controlled would reduce the CVD risk) and 2) non-modifiable (could not be modified to reduce the CVD burden). The research also reported that even the modest elevation in blood pressure, cholesterol and glucose levels would predispose an individual to a CVD risk. These biomarkers were referred to as emerging risk factors since they were directly associated with increased risk of CVD but their causative, quantitative and independent contributions to CVD were not fully elucidated with respect to conventional risk factors (Gupta, 2013).

According to Yusuf et. al in 2014, a study of age-specific trends in cardiovascular risk factors among the adolescent and young reveals that cardiovascular risk factors increase exponentially with age once Indians reach the 30- to 39-year age group. An additional cause of concern in Indians and South Asians is that they tend to have more severe manifestations of CVD and higher fatality rates (Prabhakaran, 2016). This suggests that Indians are more prone to the CVD's

There are several risk factors and complications responsible such as Diabetes.

There is more prevalence of Diabetes mellitus in the southern states of India, whereas hypertension appears to be higher in the northern states. (Prabhakaran, 2016).

The study conducted through a repeated cross-sectional survey with 5,535 participants by Roy et al., 2017 for the Indian Council for Medical Research found that the prevalence of hypertension increased from 23% to 42% in urban areas. (Prabhakaran, 2018)

A cohort study conducted by the National Institutes of Health from 2010–present with 16,288 participants reveal the *“Behavioural risk factors, low fruit/vegetable intake, smoking, and smokeless tobacco use were more prevalent in the lowest socioeconomic status participants; weight-related risk (high BMI, high waist-to-height ratio, and prevalence of diabetes, hypertension, and dyslipidaemia) was higher among high socioeconomic status participants”* Ali et al., 2016

**Methodology:-**The study aims to understand the prevalence rate, in accordance to age, sex and frequency of prevalence of risk factors. The study design includes a retrospective risk factor survey with the help of a self-constructed structured questionnaire with 14 questions reviewed and validated by the experts such as 2 doctors, 4 nurses and 4 professors. This survey was a self-administered tool created on google forms and was sent through email and WhatsApp. A sample size of 88 people who were from the vicinity of Delhi and NCR and were the age 40+ had filled the survey with informed consent and ethical measures were shared.

The questionnaire was used to elicit information from each study participant for the following variables: (i) demographic characteristics such as age, sex, etc; (ii) lifestyle-related factors

such as dietary habits, smoking, activity level, stress level, cholesterol level etc; (iii) the health status of the individual and any history or family history related to heart disease, stroke, hypertension and diabetes.

**Results** :-There were 88 participants in total residing in the urban areas of Delhi and NCR. Only 27% of the participants reported having CVDs while 73% of participants were not having CVDs even though 39% of participants had mentioned a family history of CVDs while others did not. The risk factors frequency was smoking with 14% of the people agreeing to it, 40% of participants had high blood pressure and only 29.55% had high cholesterol levels. The data also revealed that there are 31% of diabetic participants and 36% reported to be obese. Out of the total participants, nearly 85% claimed to have a well-balanced diet while 87% reported good oral health and 75% to be active wherein 54% participants experienced stress.

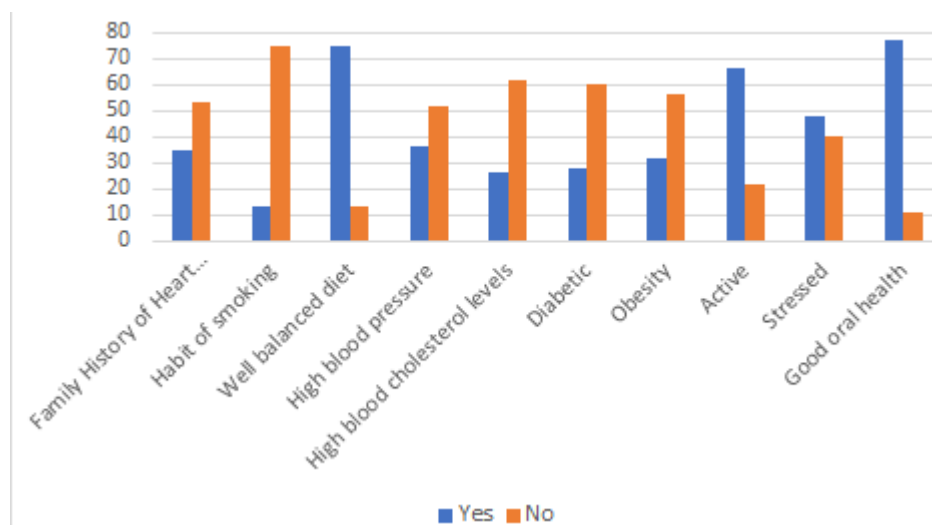


Figure 1. Total participants response to the cardiovascular complications and risk factors

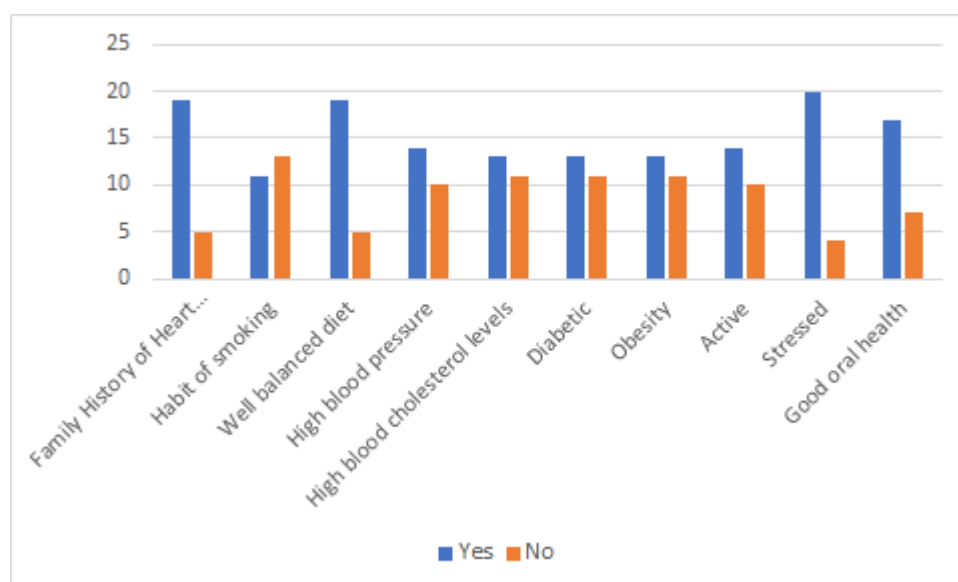


Figure 2. 24 Participants with CVD's response to the cardiovascular complications and risk factors Of the 24 participants who had CVDs, nearly 79% had a family history of CVDs. The participants who indulged in smoking were 45%, nearly 58% of participants had high blood pressure, 54% of participants had high blood cholesterol levels, 54% participants also had

diabetes, 54% were also obese with nearly 58% of participants being active. The participants also reported that 83% of them experienced stress, 79% of participants had a well-balanced diet while 70% of participants had good oral health.

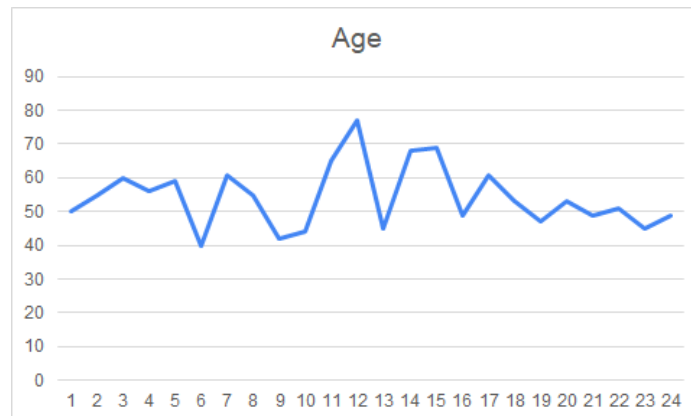


Figure 3. A scatter plot of the age of the sample

The age of the participants ranged from 40-80 years. Most of the sample was in the range of 40-60 years of age. The mean age was 54 years. There were 50 females and 28 males. It was found that there is a strong correlation between CVDs with obesity with the score of 0.22 displaying a positive correlation as it is closer to 0. There is a significance and positive correlation between CVDs and diabetes with a score of 0.29. There is also a high prevalence and correlation of CVDs with high blood pressure with a score of 0.21 as well as high cholesterol with CVDs with a score of 0.33 along with participants revealing a positive correlation of CVDs with stress with a score of 0.35 scores there is also a weak positive correlation between smoking and CVDs with a score of 0.5. Surprisingly there was a negative correlation found between Diet and CVDs with a score of -0.1, a similar negative correlation was seen with oral health in the sample of Delhi-NCR.

**Discussion:-** The research revealed a change in the pattern and trend in patients with CVDs in the Delhi and NCR for the urban population as only 24 participants out of 88 participants were affected with CVD's. As well as only 39% of participants had a family history of CVD's but had a positive correlation with CVD's. As suggested by the previous studies, there is a prevalence of high blood pressure, obesity, diabetes, high cholesterol, stress etc. (Prabhakaran, 2016) This stands true for this research study as well due to the positive correlation and high prevalence found in this sample. There can be various variables such as lifestyle, health, activity level etc that are contributing to the sustaining or initiating CVD's but this research reveals a presence of a negative correlation with diet. A study by Gupta et al also found a similar finding and suggest that it depends on the quantity and kind of food that is being taken such as "*calories, cereals and pulses, green leafy vegetables, roots, tubers and other vegetables, milk and milk products, fats and oils, and sugar and jaggery*" (2006).

The prevalence of CVD's lies between 40's and 80's but were more predominant at the age group of 50's which was also supported by Prabhakaran, 2016. Since the study was conducted on the Urban population of a metropolitan city there might be access to the diagnosis, treatment, accessibility to care and treatment, awareness about CVDs which is why only 27% cases were having CVDs, but the number would have increased in the rural setup as they do not have the access, awareness to the treatment facility etc which may be one of the reasons it goes undetected and unreported. Nag (2014)



As the study was conducted during the pandemic COVID-19 period, Participants were having stress, which also is a reason for increased blood pressure(Hypertension) and also cause an increase in blood sugar (Diabetes.).All these commodities are interrelated. Hence the participant has to be more conscious and be more aware of the Cardiovascular complication. A healthy diet and regular exercise to be done to reduce Obesity. These are can be psychoeducational classes or workshops for the patients for prevention or cure.

**Conclusion:-**There were 5 high-risk factors with a strong positive correlation and were high blood pressure, obesity, diabetes, high cholesterol and stress. Other risk factors such as smoking were also present but had a weaker correlation. CVD was most seen to be in the age group 40 to 80 with the most prevalence in the age group of 50. The urban area showed a fewer risk factor as the urban have the access to the hospitals, treatments, medicines, awareness, literacy etc while in the rural areas they may go undetected.

**Limitation:-**The limitation and the gap of the research are that the study was conducted in a small geographical location, with people who have access to digital technology. The research was conducted using a snowball technique perhaps putting the survey on social media platforms would have increased the reach of the survey. The study was conducted during the pandemic due to COVID-19 and is conducted through limited questions of the quantitative method.

**Recommendation:-**A recommendation of using a mixed-method approach by adding the qualitative semi-structured interview will enhance the data and provide further details. The survey can also be posted on several platforms that can achieve a higher reach as well as the research should be done on a larger scale. The participants can also be notified in case of indicating more than 3 high-risk factors. Further psychoeducational classes can be taken to educate them on how to decrease or stabilize the factors contributing to CVDs.

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## Fast Dissolving Tablet: A Promising Drug Delivery System along with Anti-epileptic Drug

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**ABSTRACT:**-Fast dissolving tablets emerge as one of the popular and widely accepted dosage forms, especially for pediatric patients because of incomplete development of the muscular and nervous system and a case of geriatric patients suffering from Parkinson's disorder or hand tremors. Few solid dosage forms like capsules and tablets are present days facing the problems like difficulty in swallowing (dysphagia), resulting in many incidences of non-compliance and making the therapy ineffective. Oral dosage form and oral route are the most preferred route of administration for various drugs has limitations like first-pass metabolism, psychiatric patients, bedridden and uncooperative patients. FDTs are disintegrating or dissolve quickly in the saliva without a need of water. Fast dissolving tablets are designed to dissolve in saliva remarkably faster, within a few seconds (less than 60 seconds), and those are real fast-dissolving tablets. FDTs formulations contain super disintegrants to enhance the disintegration rate of a tablet in the buccal cavity. FDTs have advantages such as easy portability and manufacturing, accurate dosing, good chemical and physical stability and an ideal alternative for geriatric and pediatric patients. FDTs have disintegrated quickly, absorb faster so, in vitro drug release time improve and this property of drugs (dosage form) enhanced bioavailability. FDT formulations have the advantage of both conventional tablet formulation and liquid dosage form. There are several technologies that are conventional or patented based on spray drying, cotton candy process, sublimation, melt granulation, direct compression freeze drying/lyophilization, phase transition process, mass extrusion, etc. have been developed for manufacturing of FDTs. In this review contain brief information about FDTs including definition, advantages, needs or requirements of FDTs, salient features of FDTs, limitations, challenges to developing FDT, marketed formulations of fast dissolving tablets, etc.

**Key Words** - Pediatric, geriatric, dysphasia, Fast Dissolving Tablets, saliva, buccal cavity, lyophilization, mass extrusion.

**INTRODUCTION:**-Today's basic need is the requirement of drugs into its presentable form. The mean of drug delivery system is the dosage forms, used for application in to a living body. There are various types of dosage like tablets, syrups, suspensions, injections, suppositories, transdermal and patches having a different type of mechanism of drug delivery. All these classical as well as the modern dosage forms have various advantages and some disadvantages as well. So it's a big challenge for the pharmacist to develop an ideal drug delivery system in present scenario. To achieve the desired therapeutic effect, it's necessary that the drug should be reached to its specific site of action at a rate and concentration to show less adverse effects and maximum therapeutic effect. A thorough study of physicochemical principles should be done before the development of a suitable dosage form [1]. Almost 50-60% of total dosage forms and administered via the oral route of drug administration. For the ease of administration, self-medication, accurate dosage, painless method and for patient compliance solid dosage forms are most popular. The most popular solid oral dosage forms are tablets and capsules, difficulty in swallowing may be the drawback with this dosage forms in some of the patients [2].

More often the problem of swallowing is more common in pediatric patients due to fear of choking, dysphasia, and hand tremors. Due to underdeveloped muscular and nervous system and in schizophrenic condition in young patients. Near about one-third population has swallowing difficulties, which leads the poor patient compliance. So to overcome this problem rapidly dissolving tablets in oral cavity has a great deal of attention [3]. United States Food and Drug Administration (USFDA) defined fast dissolving tablet (FDT) as “a solid dosage form containing a medicinal substance or active ingredient which disintegrate rapidly usually within a matter of seconds when placed upon the tongue” [3]. In the late 1970s fast dissolving drug delivery systems were first developed as an alternative to conventional dosage forms for the pediatric patient. These tablets are rapidly disintegrate in saliva within 60 seconds [5]. To fulfill these medical needs, pharmaceutical technologists have developed a novel oral dosage forms known as orally disintegrating (dispersible) tablets (ODTs) or Fast disintegrating (dissolving) tablets (FDTs) or mouth melting tablets (MMTs) or mouth dissolving tablets (MDTs), immediate release tablets which disintegrate rapidly in saliva, usually in a matter of seconds, without the need to take water. Mouth dissolving tablets are formulated mainly by two techniques first use of super disintegrants like Croscarmellose sodium, sodium starch glycolate and crospovidone. Another method is maximizing pore structure of the tablets by freeze drying and vacuum drying [5]. The direct compression method should be preferred for the formulation of such type of tablets because this method is quick, and cost effectiveness [1]. Due to absorption of such drugs in oral cavity the bioavailability of such drugs may be increased. So that the first pass metabolism of these drugs is reduced as compare to standard tablets [5]. Epilepsy is a neurological disorder, its first line treatment is administration of anti-epileptic drugs, which may be classified as- first, second and third generation of antiepileptic drugs.

Examples of few drugs according to their class as-

**First generation antiepileptic drug-** Phenytoin, Phenobarbital, Carbamazepine, Valproic acid, Clobazam and Zonisamide. (Considered as second line drug in North America and Europe.)

**Third generation antiepileptic drug-** Lacosamide and Eslicarbazepine acetate. Others recently delivered are included in the second generation. Post-second-generation antiepileptic drugs are commonly known as new antiepileptic drugs. In Japan, their administration as add-on therapy was approved in 2006 and gabapentin, topiramate, lamotrigine, levetiracetam, and rufinamide are distributed as oral drugs. Vigabatrin, oxcarbazepine, perampanel, and LCM are being considered for approval by the Japanese Ministry of Health, Labour, and Welfare.

In the definition of epilepsy revised in 2014 by the International League Against Epilepsy, the condition was defined as a disease of the brain manifesting any of the following conditions: (1) at least two unprovoked (or reflex) seizures occurring more than 24 hours apart; (2) one unprovoked (or reflex) seizure with the probability of further seizures similar to the general recurrence risk of at least 60% after two unprovoked seizures occurring over the next 10 years; and (3) a diagnosis of an epilepsy syndrome.

While the new AEDs are not superior to traditional AEDs in terms of their antiepileptic- and acute adverse effects, [12-14] their prolonged administration elicited fewer adverse effects and milder interactions with other drugs than did traditional AEDs [15-17].

Most new AEDs involve less teratogenicity and their effect on the patients' physical status, including hormone secretion and the bone and lipid metabolism, are milder [19].

The lower teratogenicity of LTG and LEV has raised interest in these drugs. The new AEDs also offer favorable side benefits with respect to concurrent diseases and conditions[20].

Several new AEDs have unique binding sites, LEV binds to synaptic vesicle 2 (SV2), PER to the  $\alpha$ -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptor, and LCM to collapsin response mediator protein-2 (CRMP2). The possibility that their unique profiles render the new AEDs advantageous for combination therapy has been suggested [16].

As it is expected that new AEDs will be prescribed widely, cognizance of their basic mechanisms of action and their specific characteristics is important. This review presents an outline for the use of these drugs in adult epileptics based on the pharmacological activity of the new generation of AEDs, and discusses clinical indications for the use of these new drugs.

### **Seizure Classification**

More than 40 distinctive epileptic signs have been recognized and generally classified into partial and generalized seizures. The partial seizures report for about 60 percent of all epilepsies and usually are due to a lesion in some part of the cortex, tumors, trauma, developmental malformations, stroke, and infections. Partial seizures are related with electrical discharge that begins locally and often remains localized. Partial seizure may generate relatively simple signs without loss of consciousness, such as involuntary muscle contractions, autonomic discharge or abnormal sensory experiences or, they may cause more complex effects on consciousness, mood and behavior, often termed psychomotor epilepsy. In psychomotor epilepsy, which is often related with a focus in the temporal lobe, the attack may consist of stereotyped movements such as rubbing or tapping movements, or much more complex behavior like walking, dressing, or hair-combing.

The seizure generally lasts for a few minutes, after which the patient get wells with no memory of the event. The manners during the seizure can be bizarre and convoyed by a strong emotional response. The generalized epilepsy report for approximately 40 percent of all epilepsies and etiology is normally genetic. Generalized seizures involve the entire brain, as well as the reticular system, thus generating abnormal electrical activity throughout both hemispheres. Instant loss of consciousness is feature of generalized seizures. The major categories are tonic-clonic seizures (grand mal) and absences (petit mal). A tonic-clonic seizure consists of an initial powerful contraction of the entire musculature, generating a rigid extensor spasm. Respiration prevents and micturition, defecation, and salivation are often occurs. The tonic phase lasts for about one minute and is followed by a series of violent synchronous jerks that slowly finishes in about 2-4 minutes. The patient continues unconscious for a few more minutes and then slowly recovers, feeling ill and confused. Injury may happen during the convulsive episodes. Absence seizures occur in children; they are much less dramatic but may occur more regularly than tonic-clonic seizures.

The patient suddenly ceases whatever he/she was doing, occasionally stopping speaking in mid-sentence, and stares blankly for a few seconds, with slight or no motor disturbance. With optimal drug treatment, epilepsy is prevented completely in about 75 percent of patients, and about 10 percent continue to have seizures at gaps of one month or less, which severely interrupt their life and work. Therefore need to improve the efficacy of therapy.

Common mechanism of action of antiepileptic drugs. Three major mechanisms of action are recognized:

**Modulation of voltage-gated ion channels:-** enhancement of  $\gamma$ -aminobutyric acid (GABA)-mediated inhibitory neurotransmission; and attenuation of glutamate-mediated excitatory neurotransmission [25].

Voltage-gated ion channels: Ion channels regulate the flow of positively and negatively charged ions across neuronal cell membranes and ultimately control the intrinsic excitability of the CNS. Voltage-gated  $\text{Na}^+$  channels are responsible for depolarization of the nerve cell membrane and conduction of action potentials across the surface of neuronal cells. At nerve terminals, voltage-gated  $\text{Ca}^+$  channels are recruited by  $\text{Na}^+$  channel dependent depolarization, leading to  $\text{Ca}^+$  entry, NTM release and chemical signaling across the synapse.  $\text{Ca}^+$  channels are distributed, on a cellular and anatomical basis.

The AEDs (e.g., PHT, CBZ, valproate (VPA), lamotrigine (LTG) involves the prolongation and closing of inactivation gate of  $\text{Na}^+$  ion channels, therefore reducing the capability of neurons to fire at elevated frequencies. This mechanism supplies protections against MES in animals and focal seizures in humans. A low threshold  $\text{Ca}^{2+}$  ion current (Type) manages oscillatory comebacks in thalamic neurons. The reduction of current by the use of AEDs such as [(ethosuximide (ESM)], dimethadione, VPA)[26].

Inhibitory neurotransmission: The GABA is the predominant inhibitory NTM in the mammalian CNS and is released at up to 40% of all synapses in the brain. GABA is synthesized from glutamate by the action of the enzyme glutamic acid decarboxylase.

Following release from GABA-ergic nerve terminals, it acts on the post-synaptic GABAA receptor, a ligand-gated ion channel comprising five independent protein subunits arranged around a central chloride ion ( $\text{Cl}^-$ ) pore.

The GABA-A receptor responds to GABA binding by increasing  $\text{Cl}^-$  conductance resulting in fast neuronal hyper-polarization or inhibition. The drug may work directly on the GABA-receptor  $\text{Cl}^-$  ion channel complex (e.g., barbiturates, BZDs), and inhibit the metabolism of GABA (e.g., VPA, vigabatrin) or enhance the release of GABA (e.g., gabapentin). This system affords protection against generalized and focal seizures [27].

Excitatory neurotransmission: Glutamate is the principal excitatory NTM in the mammalian brain. Release from glutamatergic nerve terminals, it exerts its effects on three specific subtypes of ionotropic receptor in the postsynaptic membrane, designated according to their agonist specificities-AMPA, kainate and NMDA.

These receptors respond to glutamate binding by increasing cation conductance resulting in neuronal depolarization or excitation. The AMPA and kainate receptor subtypes are permeable to  $\text{Na}^+$  and involved in fast excitatory synaptic transmission. In contrast, the NMDA receptor is permeable to both  $\text{Na}^+$  and  $\text{Ca}^{2+}$ , owing to a voltage dependent blockade by  $\text{Mg}^{2+}$  at resting membrane potential, is only activated during periods of prolonged depolarization, as might be expected during epileptiform discharges. Metabotropic glutamate receptors perform a similar function to GABA-B receptors; they are G-protein coupled and act predominantly as auto receptors on glutamatergic terminals, limiting glutamate release. Glutamate is removed from the synapse into nerve terminals and glial cells by a family of specific  $\text{Na}^+$ -dependent transport proteins and is inactivated by the enzymes glutamine synthetase (glial cells only) and glutamate dehydrogenase. Some AEDs (e.g., PBT, topiramate) block the AMPA receptor and some (Felbamate, remacemide) block NMDA receptors. This vital mechanism has effected in the progress of new AEDs.

## Methods of formulation of fast dissolving tablet

**1-Disintegrant addition** - involves the addition of superdisintegrants in optimum concentration to the formulation to achieve rapid disintegration/dissolution. For e.g. MCC and sodium starch glycolate are used in formulation of efavirenz, crystalline cellulose (AvicelPH-102) and low substituted HPEC used in oxybutinin and pirenzepine formulation. Crosspovidone used in galanthamineHBr. Crosspovidone (3%w/w) and crosscarmellose Na (5%w/w) used in prochlorperazine maleate formulation. Characteristics: similar to conventional tablets with higher % of disintegrants, lower hardness and higher % of friability.

**2- Freeze Drying or Lyophilization** -the drug is dissolved or dispersed in an aqueous solution of a carrier. The mixture is poured into the wells of the preformed blister packs. The trays holding the blister packs are passed through liquid nitrogen freezing tunnel to freeze the drug solution. Then the frozen blister packs are placed in refrigerated cabinets to continue the freeze drying. Finally the blisters are packaged and shipped. Characteristics: The preparations are highly porous, have high specific surface area, dissolve rapidly and ultimately show improved absorption and bioavailability.

**3- Moulding** -water-soluble ingredients with a hydro-alcoholic solvent is used and is molded into tablets under pressure lower than that used in conventional tablet compression. Characteristics: Molded tablets are very less compact than compressed tablet porous structure that enhances disintegration/dissolution and finally absorption increased.

**4- Sublimation** - inert solid ingredients that volatilize rapidly like urea, camphor ammonium carbonate, ammonium bicarbonate and hexamethylenetetramine were added to the other tablet ingredients and the mixture is compressed into tablets. The volatile materials were then removed via sublimation, which generates porous structure. Characteristics: porous structure that enhances dissolution by using volatile material or solvent e.g. cyclohexane, benzene etc.

**5-Spray-Drying** -by hydrolyzed and non hydrolyzed gelatins as supporting agents, mannitol as bulking agent, sodium starch glycolate or crosscarmellose sodium as disintegrating agent and an acidic material (e.g. citric acid) and / or alkali material (e.g. Sodium bicarbonate) to enhance disintegration /dissolution. Characteristics: prepared tablet disintegrates within 20 seconds when immersed in an aqueous medium.

**6-Mass-Extrusion** -involves softening the active blend using the solvent mixture of water soluble polyethylene glycol, methanol and expulsion of softened mass through the extruder or syringe to get a cylindrical shape of the product into even segments using heated blade to form tablets. Characteristics: The dried product can be used to coat granules of bitter tasting drugs and thereby masking their bitter taste.

**7- Direct Compression** - conventional equipment, commonly available excipients and a limited number of processing steps are involved in direct compression. Characteristics: It is most cost effective tablet manufacturing technique.

**8-Cotton candy process** - involves the formation of matrix of polysaccharides by simultaneous action of flash melting and spinning. This candy floss matrix is then milled and blended with active ingredients and excipients after re-crystallization and subsequently compressed to FDT. Characteristics: It can accommodate high doses of drug and offers improved mechanical strength.

**9-Compaction-** Melt granulation b) Phase-transition process - prepared by incorporating a hydrophilic waxy binder (super polystate) PEG-6-stearate. Super polystate not only acts as

binder and increase physical resistance of tablet but also helps the disintegration of tablet. Characteristics: It melts in the mouth and solubilizes rapidly leaving no residue. - prepared by compressing a powder containing two sugar alcohols with high and low melting points and subsequent heating at a temperature between their melting points. The tablet hardness was increased after heating process due to increase of inter particle bond induced by phase transition of lower melting point sugar alcohol. Characteristics: The compatibility increased and so sufficient hardness gained by the formulation.

**10-Nanonization** - involves size reduction of drug to nanosize by milling the drug using a proprietary wet-milling technique. The nanocrystals of the drug are stabilized against agglomeration by surface adsorption on selected stabilizers, which are then incorporated into FDTs. Characteristics: It is used for poorly water soluble drugs. It leads to higher bioavailability and reduction in dose, cost effective manufacturing process, conventional packaging due to exceptional durability and wide range of doses (up to 200 mg of drug per unit).

**11- Fast Dissolving Films** -a non-aqueous solution is prepared containing water soluble film forming polymer (pullulan, carboxymethylcellulose, hydroxypropyl methylcellulose, hydroxyl ethyl cellulose, hydroxyl propylcellulose, polyvinyl pyrrolidone, polyvinyl alcohol or sodium alginate, etc.), drug and other taste masking ingredients are used to form a film after evaporation of solvent. In case of a bitter drug, resin adsorbate or coated micro particles of the drug can be incorporated into the film. Characteristics: The thin films size less than 2X2 inches, dissolution in 5 sec, instant drug delivery and flavored after taste.

## EVALUATION:

Evaluation parameters of tablets mentioned in the Pharmacopoeias need to be assessed, along with some special tests are discussed here.

**Weight variation:** 20 tablets were selected randomly from the lot and weighted individually to check for weight variation<sup>30</sup>. Weight variation specification as per I.P. is shown in table 2. weight variation and accepted % deviation Average Weight of Tablet % Deviation 80 mg or less 10.0 More than 80 mg but less than 250 mg 7.5 250 mg or more 5.0

**Hardness:** - The limit of hardness for the FDT is usually kept in a lower range to facilitate early disintegration in the mouth. The hardness of the tablet may be measured using conventional hardness testers (Monsanto tablet hardness tester). It is expressed in kg or pound [31].

**Friability:-** To achieve % friability within limits (0.1-0.9%) for an FDT is a challenge for a formulator since all methods of manufacturing of FDT are responsible for increasing the % friability values. Friability of each batch was measure in “Electro lab friabilator. Ten pre-weighed tablets were rotated at 25 rpm for 4 min or total 100 revolutions, the tablets were then reweighed and the percentage of weight loss was calculated by the following equation-

$$F = \frac{W(\text{INITIAL}) - W(\text{FINAL})}{W(\text{INITIAL})} * 100$$

**Mechanical Strength:** Tablets should possess adequate mechanical strength to bear shocks of handling in manufacturing, packaging and shipping. Crushing strength and friability are two important parameters for the determination of mechanical strength. Crushing Strength or Tablet Tensile strength: It is the force required to break a tablet by compression in the radial direction, it is important to note that excessive crushing strength significantly reduces the disintegration time. The crushing strength of the tablet was measured by using Pfizer

hardness testers. It is calculated by an average of three observations. Tensile strength for crushing (T) is calculated using equation-

$$T = 2F / \pi * d * t$$

Where F is the crushing load, and d and t denote the diameter and thickness of the tablet,

**Measurement of Tablet Porosity:** The mercury penetration porosimeter can be used to measure the tablet porosity. The tablet porosity ( $\epsilon$ ) can be calculated by using following equation-

$$\epsilon = 1 - m / (\rho t V)$$

Where  $\rho t$  is the true density, and m and V are the weight and volume of the tablet, respect.

**Wetting time and water absorption ratio:** Wetting time of dosage form is related to with the contact angle. Lower wetting time implies a quicker disintegration of the tablet. The disintegration time for FDT needs to be modified as disintegration is required without water, thus the test should mimic disintegration in salivary contents. For this purpose, a petridish (10 cm diameter) was filled with 10 ml of water. The tablet was carefully placed in the center of petridish and the time for the tablet to completely disintegrate into fine particles was noted. The water absorption ratio, R can be the determined according to the following equation-

$$R = 100 (W_a - W_b) / W_b W_b;$$

The weight of the tablet before keeping in the petridish  $W_a$ ; the wetted tablet from the petridish is taken and reweighed [34].

**Moisture uptake studies:** Moisture uptake studies for FDT should be conducted to assess the stability of the dosage form. Ten tablets from each formulation were kept in a desiccator over calcium chloride at 37°C for 24h. The tablets were weighed and exposed to 75% relative humidity, at room temperature for 2 weeks. Required humidity was achieved by keeping saturated sodium chloride solution at the bottom of the dessicator for 3 days. One tablet as control (without super disintegrants) was kept to check the moisture uptake by the other excipients. Tablets were weighed and the percentage increase in the weight was recorded.

**In-vitro dispersion time:** Tablet was added to 10 ml of phosphate buffer solution, pH 6.8 at 37±0.5°C. Time required for complete dispersion of a tablet was measured.

**Disintegration test:** The time for disintegration of FDTs is generally less than 1 min and actual disintegration time that patient can experience ranges from 5 to 30s. The disintegration test for FDT should mimic disintegration in mouth within saliva [35].

**Modified disintegration test:** A petridish (10cm diameter) was filled with 10 ml of water. The tablet was carefully put in the center of petridish and the time for the tablet to completely disintegrate into fine particles was noted.

**Disintegration in oral cavity:** The time required for complete disintegration of tablets in mouth was obtained from six healthy volunteers, who were given tablets from the optimum formulation.

**Dissolution test:** The dissolution methods for FDT are practically identical to conventional tablet when FDT does not utilize taste masking. Commonly the drugs may have dissolution



conditions as in USP monograph. 0.1N HCl, pH 4.5 and pH 6.8 buffers should be used for evaluation of FDT in the same way as their ordinary tablet counterparts. USP 2 paddle apparatus is most suitable and common choice for dissolution test of FDT tablets as compared to USP1 (basket) apparatus due to specific physical properties of tablets. In paddle apparatus the paddle speed of 25-75 rpm is commonly used. Since the dissolution of FDTs is very fast when using USP monograph conditions hence slower paddle speeds may be utilized to obtain a comparative profile. Large tablets ( $\geq 1$  gram) may produce a mound in the dissolution vessel which can be prevented by using higher paddle speeds [36].

**Clinical studies:** In vivo studies show the actual action of FDT in the oral–esophageal tract, their pharmacokinetic and therapeutic efficacy, and acceptability. The investigation using gamma-scintigraphy showed that the dissolution and buccal clearance of fast disintegrating dosage forms was rapid [37]. The esophageal transit time and stomach emptying time were comparable to those of traditional dosage forms i.e. tablets, capsules, or liquid forms [38].

**Stability study (Temperature dependent):** The fast dissolving tablets stored under the following conditions for a period as prescribed by ICH guidelines for accelerated studies. (i)  $40 \pm 1^\circ\text{C}$  (ii)  $50 \pm 1^\circ\text{C}$  (iii)  $37 \pm 1^\circ\text{C}$  and RH  $75\% \pm 5\%$  The tablets were withdrawn after a period of 15 days and analyzed for physical characterization such as visual defects, Hardness, Friability, Disintegrations, and Dissolution etc. The data obtained is fitted into first order equations to determine the kinetics of degradation

**CONCLUSION:-**Fast dissolving tablets are innovative dosage forms developed and specially designed to overcome some of the problems that seen in conventional solid dosage form i.e. difficulty in swallowing of the tablet in geriatric and pediatric patients. Fast dissolving tablets are designed to dissolve or disintegrate quickly in the saliva generally within less than 60 seconds (range of 5-60 seconds). Fast dissolving tablets have better patient compliance and acceptance may improve biopharmaceutical properties, bioavailability improved efficacy, convenience, and better safety compared with conventional oral dosage forms. The popularity of FDTs has increased fabulously over the last decade. FDTs need to be formulated for psychotic patients, bedridden, geriatric, pediatric patients, for those patients who may not have access to water, patients who are busy in traveling. FDTs formulations formulated by some of these conventional and patent technologies and FDTs have sufficient mechanical strength, quick disintegration/dissolution in the buccal cavity without water. The newer technologies utilized for the formulation of the FDTs that provide more effective dosage forms with more advantages and minimal disadvantage.

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## HOW ALCOHOL RUINS MARITAL RELATIONSHIPS

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**INTRODUCTION:-**Alcohol abuse and alcoholism within a family is a problem that can destroy a marriage or drive a wedge between members. That means people who drink can blow through the family budget, causes fights, ignore children, and otherwise impair the health and happiness of the people they love. Of married couples who get into physical altercations, some 60-70 percent abuse alcohol. In time, family members may even develop symptoms of codependency, inadvertently keeping the addiction alive, even though it harms them. Family therapy and rehab can help.

As the National Council on Alcoholism and Drug Dependence discusses, the following are some of the ways in which problem drinking affects family members, employers, colleagues, fellow students, and others:

- *Neglect of important duties:* Alcohol impairs one's cognitive functions and physical capabilities, and this, at some point, will likely result in neglect of responsibilities associated with work, home life, and/or school.
- *Needing time to nurse hangovers:* Alcohol has various short-term side effects, such as hangovers. The physical state of a hangover may be temporary, but it can significantly disrupt a person's ability to meet commitments as well as invite unhealthy behaviors, such as poor eating and a lack of exercise.
- *Encountering legal problems:* Drinking can increase a person's likelihood of getting into fights, displaying disorderly conduct in public, driving under the influence, and becoming involved in domestic disputes or violence.
- *The inability to stop at will:* Alcohol is an addictive substance and can lead to physical dependence. Although a person who is physically dependent (i.e., has an increased tolerance among other side effects) is not necessarily addicted, ongoing drinking is a slippery slope that can lead to addiction.

### **In essence, alcohol abuse causes a person to make drinking a priority**

As a result, the time, effort, and resources formerly dedicated to life-sustaining activities, such as working and spending time with the family, are disrupted. Initially, a person may think that abusing alcohol will help them deal with these stressors, but as they continue to drink a lot, over time, this abuse can turn into dependence on the substance. Once individuals become psychologically addicted, alcohol abuse can become all-consuming. As individuals are often part of social networks, it is easy to understand how alcohol abuse has a ripple effect across a person's entire network of family, friends, employers, colleagues, and anyone else who depends on the person.

**Alcohol isn't necessarily the big bad wolf. But if you aren't aware of how it can affect you, your partner, and your interactions, it definitely can bite.**

### **Alcohol Incites Too Many Arguments**

Alcohol is sure to lead to arguments.

**Your loved ones may:**

- be worried about your mental and physical health
- feel that you're putting yourself and others in danger
- feel like you're choosing alcohol over your relationships with them

Regardless of the reasoning behind the arguments, these encounters become destructive as they continue. In many cases, arguments about alcohol develop into arguments about deeper issues, leading to breakdowns and ongoing problems in your relationship.

### **Here are three key reasons why alcohol so often affects people in negative Ways:**

1. It's a drug. By definition, alcohol (even in small amounts) can alter a person's emotions, perception, and thought process. A known depressant, alcohol can lower your mood and inhibitions—a potential recipe for faster-to-ignite situations between you and your partner.
2. It enjoys a cultural "pass." Alcohol is widely accepted in the culture. Consciously or not, we often downplay its negative effects and view it as an almost mandatory aspect of celebrating, de-stressing, and so on. Case in point: Have you ever said something like: "I only said that because I was drunk," "We only fight when we've been drinking," or "We can't celebrate our anniversary without wine?" These could be red flags that you're failing to recognize the power that alcohol can have on you and your partner.
3. Its psychological effects directly influence social interaction. We already alluded to the idea that alcohol can impact your mood. To be more specific, heavy or even moderate drinking can cause a person to be more aggressive, disinhibited, defensive, sensitive, and irrational. These psychological effects can persist even after alcohol is out of your system, and in the long term can change brain function.

### **5 Ways to Reduce the Effect of Alcohol on Your Relationship**

Let's say you've identified alcohol as a negative influence on you and your partner: It's fueled arguments, nit-picky behaviors, and otherwise unloving interactions, even if only slightly and occasionally. So, how can you start mitigating the effects within your marriage or partnership? Consider these five tips, realizing that some may be more or less feasible for you personally than others:

1. Commit to drinking responsibly. For men, that means up to two alcoholic beverages per day. For women, it's up to one. Remain present and really enjoy your drink. Make a ritual of it, such as toasting each other and saying something you feel grateful for before going bottoms up. If you do this, the recommended daily maximum should be more than enough.
2. Consider only imbibing when you're out of the house. The added expense of buying priced-up alcohol at a bar or restaurant may help you curb the habit. Plus, sitting around at home drinking in a familiar environment can often fuel unnecessary conflict or excessive consumption. (It goes without saying that if you are drinking out of the house, you're always ensuring you have a safe ride home.)
3. Complete a sober month together. Made famous by "Dry January," sober months are growing in popularity. In addition to boosting your mood and helping you save money, research shows that going alcohol-free for 30 days can improve sleep, blood sugar and cholesterol levels, weight, and liver function.

4. Go on more alcohol-free dates. Spending quality time together doesn't have to involve a bottle of wine. Try going out to breakfast, taking a hike, swimming, or doing some other activity where alcohol won't be missed.
5. Designate one or more days of the week as alcohol-free. If the thought of going a month without alcohol sounds unpleasant, start with one day. Hopefully, you and your partner will notice the benefits and feel inspired to add a few more days to your rotation. (We highly recommend creating a catchy phrase to make it more fun and "stickwithable"—like Wine-Free Wednesday or Sober Sunday.)

Your ability to enjoy alcohol is ultimately predicated on how well you can do so responsibly. And it's up to you and your partner to decide if and how alcohol can maintain a place in your relationship. The good news is that cutting back on your consumption offers far more benefits than the challenges it may present . . . and just imagine how nice it would be to never have to live through another hangover.

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## ROLE OF NURSE IN DIABETES MELLITUS

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A nurse is a caregiver for patients and helps to manage physical needs, prevent illness, and treat health conditions. To do this, they need to observe and monitor the patient, recording any relevant information to aid in treatment decision-making. The roles and responsibilities of the nursing team relating to diabetes care include: Prevention advice, using behaviour change and health coaching techniques (See: Making Every Contact Count & Support Behaviour Change) Screening, prevention and early detection of type 2 diabetes. Promoting self-care.

### Diabetes Mellitus Signs and Symptoms

- Frequent urination.
- Excessive thirst.
- Unexplained weight loss.
- Extreme hunger.
- Sudden vision changes.
- Tingling or numbness in the hands or feet.
- Feeling very tired much of the time.
- Very dry skin

### Complications

- Cardiovascular disease. ...
- Nerve damage (neuropathy). ...
- Kidney damage (nephropathy). ...
- Eye damage (retinopathy). ...
- Foot damage. ...
- Skin conditions. ...
- Hearing impairment. ...
- Alzheimer's disease.

### How do manage diabetes mellitus?

People with diabetes must take responsibility for their **day-to-day care**. This includes monitoring blood glucose levels, dietary management, maintaining physical activity, keeping weight and stress under control, monitoring oral medications and, if required, insulin use via injections or pump.

**Nurse's Role:-** Screening, Prevention and early Detection of type 2 Diabetes Nurses should assist in screening the cases in the community area and also bring awareness regarding risk factors of diabetes.

**Promoting Self-care Encourage:-**Patients to use their personalized care plans regarding balance diet, exercise and activities.

**Mental Health:-**Nurses also must have to know the patients psychological aspects such as stress, depression etc and try to solve.

**Nutrition:-**The diet plan is more vital in patients with diabetes to control the glucose level and prevent further complications.

**Urine Monitoring:-** To perform the test unsupervised at the request of a registered nurse.

- To Document and report the results following local guidelines and procedures.

Blood Glucose Monitoring

- To perform the test unsupervised, at the request of a registered nurse.
- To document and report the result according to local guidelines and procedures.
- To recognize and follow local quality assurance procedure, including disposal of sharps.
- To recognize hypoglycemia and be able to administer glucose.
- To understand the normal range of glycaemia and report any readings outside this range to the appropriate person.

**Oral Therapies**

- To demonstrate an understanding of the on-going nature of the therapy.
- To report any identified problems appropriately.
- To recognize the signs of hypoglycemia and administer glucose.

Inject Able Therapies

- To aware of local sharps disposal policy.
- To show and understanding of the ongoing nature of the therapy.
- To administer insulin competently where supported by local policy.
- To report identified problems appropriately.
- To all nursing staff who handle prescribe or administer insulin should undertake a training course. e.g. NHS

Diabetes - safe use of insulin elearning.

**Hypoglycemia**

For the identification and treatment of hypoglycemia you should be able to:

- To state the normal blood glucose range.



- To describe the mild and severe signs and symptoms of hypoglycemia.
- To demonstrate competent use of blood glucose monitoring equipment to confirm hypoglycemia.
- To offer appropriate treatment as per local guidelines.
- To know where treatment for hypoglycemia is stored.
- To reassure and comfort the person with diabetes and their carer.
- To document and report a hypoglycemia event to a registered nurse.

### **Hyperglycemia**

For the identification and treatment of hyperglycemia you should be able to:

- To state the normal blood glucose range

To perform blood and ketone tests according to local guidelines

- To correctly document the results and report those out of the accepted range to the appropriate person
- To recognize that older people may be asymptomatic of hyperglycemia.

**CONCLUSION:**-Nurses promote healthy lifestyles, advocate for patients and provide health education. They also provide direct patient care. As key members of healthcare teams, they provide our communities with the knowledge needed for healthy living.

The skilled/specialist nurse plays a significant role in managing patients with diabetes mellitus by regular care and identifying various symptoms/complications at the early stage thus assist in leading normal/comfort life for diabetics.

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## Re-opening of libraries in the Pandemic Covid-19: Challenges and Planning

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**ABSTRACT:-**Pandemic Covid-19 is infectious disease originated from China and it affected routine life of the general public. Most of the countries in the world have unlocked their lockdown period; similarly Indian government also initiated to unlock this period except high risk zones and reopen all sectors on regular basis to start their business and services. Similarly in education sector support services like libraries and role of librarians are important to provide quality services to fulfil the basic needs of their users. Libraries are the centralise places for staff, students and visitors; chances of getting infection of Covid-19 are more, therefore strategic planning is important while reopening libraries in the covid-19. The study described challenges and planning in the reopening of libraries in the covid-19. Study will be helpful to all library professionals to understand challenges and how to prepare their own plan to implement in the libraries.

**1. INTRODUCTION:-**There are over 3.5 million people who have been reported infected and more than 2, 50,000 people who have died across the world in the first week of May 2020. The COVID-19 is an infectious disease caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) [1]. Muhammad Yousuf Ali and Peter Gatiti (2020) have raised awareness through the public health education, provided supports and links of useful resources to their users including medical staff and researchers in the lockdown period. And they suggested whatsapp is a reliable source of current information in the period of Covid-19 and they have shared a whatsapp link with their library users to see rumours and fake news [2]. Ken Cai, Jianna He and Peter KK Wong et.al (2020) have found that teaching and research was a challenging task for the faculties of all universities and found difficulties for MD research projects due to the pandemic of Covid-19. As well as faculties have used ICT tools for online teaching students, delivered tutorials, lectures and provided updates regarding their academic curriculum through emails, websites and webinars [3]. Crawford Joseph, Butler-Henderson Kerryn and Rudolph Jurgen et.al (2020) have highlighted in their research that Covid-19 Pandemic has created challenges in worldwide higher education [4]. Pradeep Sahu (2020) has found that universities have taken decisions to prevent their students and staff from infectious disease covid-19 and faculty members choose an online platform for delivering lectures and providing notes. In the study highlighted impact of Covid-19 especially on education as well as health of students and staff [5]. Khan, Naushad et al. (2020) studied the corona impact on the world economy. It is mentioned that America got problem on economy in the pandemic situation, created unemployment and it is also found that the World economy impacted on Colleges, Universities and Schools [6].

**2. CHALLENGES FOR REOPENING LIBRARIES:-**Libraries are at the high risk or hotspot place during pandemic situation as many users are visiting and accessing library at a large on daily basis. In such case, Library Personnel has to deal with library users in direct contact being in risk zones. Overall study of what could be the challenges in post lockdown situation is analysed in a following manner:

- a) To maintain social distance among library users is the big challenge for each and every library
- b) At the time of issue-return of books and other library materials on the circulation counter is the high risk.

- c) Library is the heart of the college or any institution; numbers of students, staff as well as visitors are coming from various locations in the library hence that is big challenge to identify infected library users.
- d) Many academic libraries have given open access to their users but in the Covid-19 it is risk because users will touch many books for selection.
- e) Effect on Library services such as how to sort or separate the library collection for circulation.
- f) Fear, worry, uncertainty and nervousness among the library staff to handle this situation.
- g) To follow first three laws of Library science of Dr. S. R Rangnathan; 1. Books are for use 2. Every reader his or her book 3. Every books its reader, to give library services in the covid-19 is the big challenge.
- h) Due to the technical issues and lack of ICT skills among the libraries staff, it is highly impossible to provide all kind of library services online. It is difficult to train them during the lockdown.
- i) In the lockdown period to avail teaching and learning materials to staff & students due to lack of supply from the book/journal vendors. It means there are obstacles in the collection development.
- j) Shifting paradigm of e-services in the new normal from traditional library services.
- k) To convert currently available physical resources of the library into digital form considering copyright policies.

### **3. PLANNING FOR REOPENING LIBRARIES**

As discussed earlier library is the central place for all stakeholders of institute, every education organisation should pay keen attention towards it. Risk of affecting health of employees, students and visitors is high unless there is end solution on pandemic Covid-19 virus situation. Every library should prepare their own plan as per the structure; it includes library entrance, circulation counter, students reading hall, digital library, reference section, book racks etc. Following are the remedial measures and an attempt to provide standard plan after unlock is declared by the government to provide safety environment.

#### **3.1 Practices to reduce the infection of Covid-19**

- Cleaning and sanitizing: Internal surfaces including table phone, door handles, returned books, computers, circulation counter, should be frequently cleaned.
- Cleaning and Disinfecting: Frequently cleaning and disinfecting of objects and surfaces touched by many individuals.
- Daily cleaning with chemical, detergent, soap and water that will kill the surface virus.
- Returning library materials could be infected therefore it should not be re-issued for some period of time. Those materials should be kept safety place for some hours.
- Keep sanitizer at entrance gate of the libraries.
- Avoid unnecessary crowd in the Libraries.

#### **3.2 Library staff**

- Maintain minimum 6 feet social distancing at working area.
- Frequently washing hands and use sanitizer to sanitise.
- Wearing mask and hand gloves while providing library services.
- Infected staff should stay at home.

#### **3.3 Library users**

- Users should not be allowed in the library without face mask.
- At the entrance of the library temperature checks equipment and sanitizer facility should be availed for staff and students.
- Giving circulation facilities on prior appointment.

- Restrictions of social distancing on library users those coming and going through the library entrance as well as users should not be enter in the group at a time.
- Gatherings of staff and students in the library premises should not be allowed.
- Seating arrangement in the reading hall should be as per the protocol of social distancing i.e. 3-6 feet distance from other students.
- Allowing limited numbers of users into the library will be helpful.
- Visitors in the queues should be following the distance as per standards.
- Sharing information or instructions regarding covid-19 implications to all library users via different platforms such as e-mail, facebook, twitter and whatsapp etc.

**CONCLUSION:-**Pandemic Covid-19 situation has affected all the countries and has a serious impact on all the sectors of economy including Education. The present paper has traced the impact of above situation to know the future challenges and how to deal with them once lockdown is closed related to educational libraries. Studying the challenges mentioned above, library professionals will be able to understand and deal with the situation confidently whereas planning or remedial measures will help them to keep safety environment for themselves and well being of library users.

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## Synthesis of metal chelate of Co(II) and Ni(II) with ligand 2-amino-3-chloro-1,4-naphthoquinone-1 oxime and their structure elucidation study &Antimicrobial Activity.

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**ABSTRACT:**-Cobalt (II) and Nickel (II) metal chelates were synthesized using 2-amino-3-chloro-1,4-naphthoquinone 1-oxime (ACNQO). Modern analytical techniques such as elemental analysis, FTIR, Electronic spectra, Mass spectroscopy, Thermogravimetry, NMR, X-ray diffraction, and ICPMS were used to classify these metal complexes, namely Co(ACNQO)<sub>2</sub> and Ni (ACNQO)<sub>2</sub>. These chelates are thermally stable up to 700°C and come in a variety of colors. The Agar Well Diffusion Method was used to determine the antimicrobial activity of metal salts and metal chelates against Gram positive and Gram negative bacteria and fungi, and the results were compared to those obtained with Cisplatin as a control.

**KEYWORDS:**-2-amino-3-chloro-1,4-naphthoquinone 1-oxime, X-ray diffraction, IR, Antimicrobial activity, Electronicspectra, ICP-MS, NMR.

**INTRODUCTION :-** Antimalarial, antibacterial, antitubercular, and antitumor agents, as well as larvicides, herbicides, and fungicides, are only a few of the biological uses of 2-amino-3-chloro-1,4-Naphthoquinones (1-3). As a result, research on these compounds, derivatives, and metal complexes have often focused on them. Cobalt (atomic weight 58.933, electron configuration: [Ar]) is a metal with the atomic number 27 and the atomic weight 58.933. (3d<sup>7</sup> 4s<sup>2</sup>). Cobalt, like nickel, is contained in the Earth's crust only in chemically mixed form, with the exception of small deposits found in natural meteoric iron alloys. As the free element, reductive smelting produces a hard, lustrous silver-gray alloy. Co is a d-block unit that completes the Octet law. Co can quickly contribute two electrons in its outermost valence shell, allowing it to donate two electrons and form a stable complex; on the other hand, the ligand 2-amino-3-chloro-1,4-naphthoquinone 1-oxime can accept an electron and form a stable complex, allowing their synthesis and characterization to be studied. Nickel metal complexes are analysed similarly to Co metal complexes. Nickel is an atomic number 28 chemical element with the symbol Ni. It is a lustrous silvery-white metal with a tinge of gold. Nickel is a transition metal that exhibits characteristics of both rigidity and ductility. Although pure nickel powdered to maximise the reactive surface area has a high chemical activity, larger sections require longer to react with air under normal conditions due to the

formation of an oxide coating on the surface that prevents further corrosion. ([Ar] (3d8 4s2) or [Ar] (3d8 4s2) atomic mass 58.69) (3d9 4s1). Numerous publications describe various methods for synthesising the ligand 2-amino-3-chloro-1,4-naphthoquinone 1-oxime (4,5,6,7). This article summarises the synthesis and characterization of Co metal chelates with the ligands 2-amino-1,4-naphthoquinone and 2-amino-3-chloro-1,4-naphthoquinone 1-oxime using current analytical techniques, as well as their microbiological activities.

## **MATERIALS USED FOR SYNTHESIS AND SYNTHESIS PROCESS**

The ligand 2-amino-3-chloro-1,4-naphthoquinone-1 oxime was synthesized from 2-amino-3-chloro-1,4-naphthoquinone which was supplied by Sigma-Aldrich.

### **2.1. Synthesis:**

**2.1.1 Synthesis of 2-amino-3-chloro-1,4-naphthoquinone-1 oxime from 2-amino-3-chloro-1,4-naphthoquinone:** About 10.0 gm Sodium hydroxide was dissolved in 80 mL of water, to which about 8.2 gm of 2-amino-3-chloro-1,4-naphthoquinone was added slowly. To this mixture a solution of 4 gm hydroxyl amine hydrochloride dissolved in 80 mL distilled water was added. On a water bath, the whole mixture was warmed for one hour at 50-60°C. After one hour, the reaction mixture was brought to room temperature before being cooled in an ice bath to around 50°C. After that, cooled distilled water was added to the solution, which was then neutralised with freshly prepared dilute Hydrochloric acid. Until precipitation forms, dilute hydrochloride acid was added. Filter and wash the precipitate with cold water. The solid was collected and dried on a hot plant.

### **2.2.3 Co chelate with 2-amino-3-chloro-1,4-naphthoquinone-1oxime:**

0.445 gm 2-amino-3-chloro-1,4-naphthoquinone-1 oxime ( $2 \times 10^{-3}$  mole) was dissolved in 20 mL methanol and thoroughly mixed to form a transparent solution (Ligand solution), which was then refluxed for 15-20 minutes. 0.281 gm Cobalt sulphate heptahydrate ( $1 \times 10^{-3}$  mole) was dissolved in 10 mL water and stirred well to obtain a clear solution. This solution was applied to the ligand solution drop by drop under reflux conditions, keeping the temperature of the solution about 60°C. The solution was then heated in a reflex state for half an hour. Cool the reaction mixture, then check the pH of the solution, which was then changed to 6.5 using a dilute Ammonia solution. Continue to reflux the solution and check the pH of the solution; if necessary, the pH of the solution was changed to 6.5. Reflux was continued for two hours, after which the solution was cooled and filtered to remove the solids. On a hot plate, the solid was dried.

### **2.2.4 Nickel chelate with 2-amino-3-chloro-1,4-naphthoquinone-1oxime:**

0.445 gm 2-amino-3-chloro-1,4-naphthoquinone-1 oxime ( $2 \times 10^{-3}$  mole) was dissolved in 20 mL methanol and thoroughly mixed to form a transparent solution (Ligand solution), which was then refluxed for 15-20 minutes. In 10 mL water, dissolve 0.263 gm nickel sulphate hexahydrate ( $1 \times 10^{-3}$  mole) and stir well to obtain a clear solution. This solution was applied to the ligand solution drop by drop under reflux conditions, keeping the temperature of the solution about 60°C. The solution was then heated in a reflex state for half an hour. Cool the reaction mixture, then check the pH of the solution, which was then changed to 6.5 using a dilute Ammonia solution. Continue to reflux the solution and check the pH of the solution; if necessary, the pH of the solution was changed to 6.5. Reflux was continued for two hours, after which the solution was cooled and filtered to remove the solids. On a hot plate, the solid was dried.

## **III .INTERPRETATION OF ANALYTICAL DATA**

### **3.1 Instrumental analysis :**

The structure of the synthesised compound was determined using elemental analysis, FTIR, Electronic spectra, Mass spectroscopy, Thermogravimetry, X-ray diffraction, and ICP-MS.

### 3.1.1 Fourier-transform infrared spectroscopic study:

The FTIR study's objective was to characterize functional groups and to validate their composition. On a Perkin Elmer instrument with a scale of 4000-400 $\text{cm}^{-1}$ , the FTIR spectra were registered in KBr matrix. The following table describes the most frequently identified functional groups in ligand and metal complexes using infrared spectroscopy.

Table-1: Typical functional groups by IR spectroscopy of ligand and metal complex,

Compound → Functional group ↓	Typical IR frequencies (cm <sup>-1</sup> ) ↓	Experimental IR frequencies (cm <sup>-1</sup> )		
		NQO	Co (ACNQO) <sub>2</sub>	Ni (ANQ) <sub>2</sub>
M-O	700-500		553, 571, 665, 675,	500, 506, 552, 576, 588
M-N	700-500	--	684, 709	620, 664, 670, 685
C-Cl	850-550 S	770	728, 749, 789	700, 729, 750, 767, 793
C-H	900-700 B	861, 835, 811, 797, 788, 782, 770, 749, 722, 710	813, 844, 862, 872, 883, 892,	801, 814, 845, 861, 870, 882, 894
	1465-1365 B	1470, 1434, 1421, 1396, 1391, 1379, 1369, 1360	1370, 1397, 1438, 1465	1352, 1372, 1392
C=C	995-790 B	, 967, 926, 861, 835, 811, 797	948, 973, 986	950, 973, 986
	1670-1600 S	1668, 1660, 1653, 1634, 1617, 1603	1614, 1637	1608, 1632
C-N	1342-1266	1340, 1327, 1315, 1296, 1281, 1270,	1251, 1278, 1307, 1326, 1344	1248, 1279, 1315, 1327
N-O	1550-1500 S	1497	1555	1555
C=N	1690-1640 S	1675, 1668, 1660, 1653	1614, 1637	1608, 1632
C=O	1870-1650 S	1864, 1830, 1675, 1668, 1660, 1653	1917, 1637	1632, 1917
N-H	3500-2800 S	3456, 3273, 3098	3203 BS	3212BS
O-H	3700-3584 B	3671, 3612	Broad spectrum @ 3200-3600	Broad spectrum @ 3250-3700

B=Bending, S=Stretching, M=Metal,

For IR frequency evaluation study, Gaussian 09 software was used. Above IR frequencies are matches with literature values. Fig- 1 to 3 indicates the IR spectra metal complexes.

Fig-1: IR spectra for 2-amino-3-chloro-1,4-naphthoquinone 1-oxime (ACNQO)

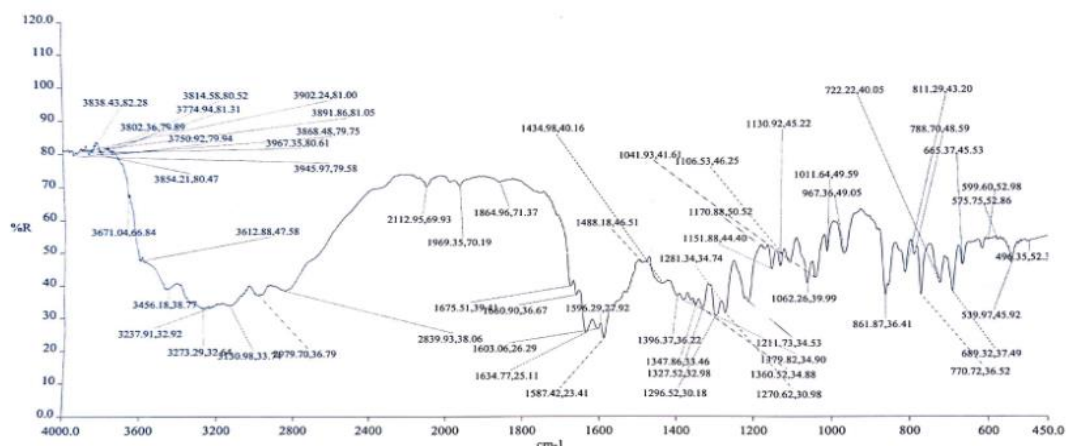


Fig-2 : IR spectra for Co metal complex with 2-amino-3-chloro-1,4-naphthoquinone 1-oxime

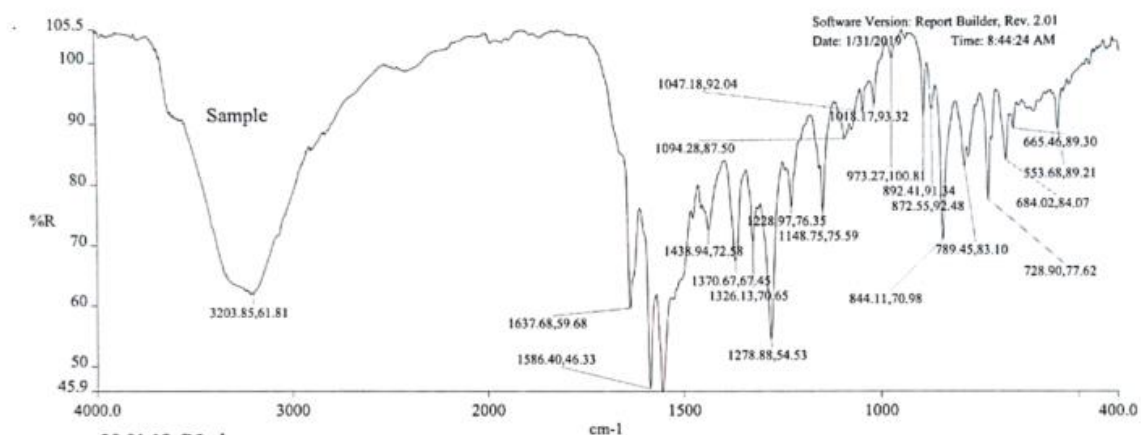
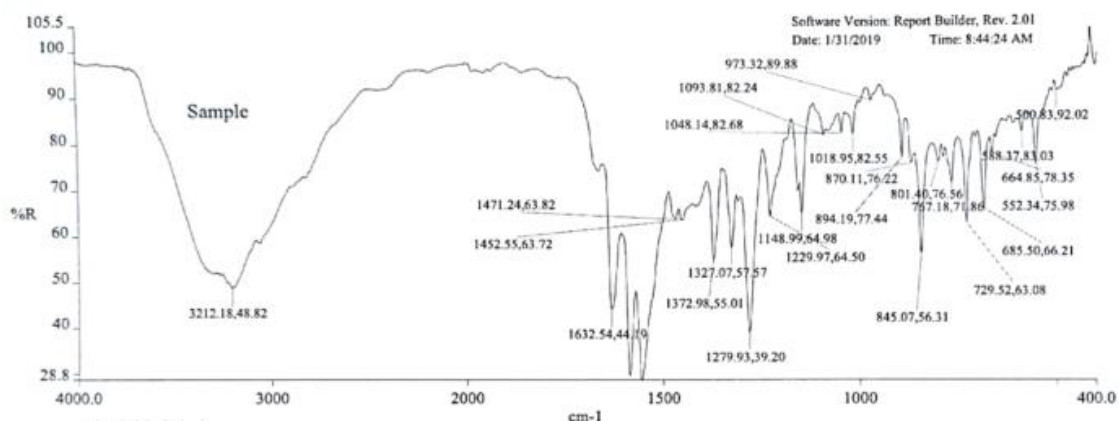


Fig-3 : IR spectra for Ni metal complex with 2-amino-3-chloro-1,4-naphthoquinone 1-oxime



### 3.1.2 UVspectrophotometric study (Electronic spectroscopy):

The UV spectrum of metal chelate and its co-relation with ligand were investigated using electronic spectroscopy. Metal chelate UV spectra were recorded on a Shimadzu instrument in the solvent DMSO, and ligand UV scans were recorded in methanol solvents. A pulse of UV-Visible light is transmitted through the sample solution in UV spectroscopy; a molecule absorbs the UV or visible radiations and becomes extinct. The electron shifts from an occupied to an unoccupied molecular orbital. As a result, this form of spectroscopy is also known as electronic spectroscopy.

Energy transitions are observed as  $\eta \rightarrow \pi^*$ ,  $\eta \rightarrow \sigma^*$ ,  $\pi \rightarrow \pi^*$ ,  $\sigma \rightarrow \pi^*$ ,  $\sigma \rightarrow \sigma^*$ .



Table 2 : Experimental  $\lambda_{\max}$  observed

Compound ↓	$\lambda_{\max 1}$	$\lambda_{\max 2}$
(ACNQO) <sub>2</sub>	nm	nm
ACNQO) <sub>2</sub>	nm	nm

Observed  $\lambda_{\max}$  are due to energy transitions of metal complex.

### 3.1.3 Mass spectroscopic study:

For determining the mass to charge ratio of ions, mass spectroscopy is commonly used. This method is used in the pharmaceutical industry to determine the mass of molecules.

The mass to charge ratio, or m/z of the ligand and metal complex, was determined using mass spectroscopy. The sample is transformed to vapour phase and a high-energy electron is bombarded to knock out an electron in this technique. As a result, a positively charged ion known as a molecular ion, or M+, is formed. M+1 and M+2 ions were formed as a result of the ionisation.

The generated ions are studied and registered under an electric and magnetic field, yielding a mass spectrum. The ligand and metal chelate molecular weights were determined using a Shimadzu quadrupole mass spectrometer, and the results are presented in Table 3.

Table 3: Molecular weights of ligand and metal complex

Mass spectroscopic data → Compound ↓	Theoretical molecular weight	Experimental data	
		m/z	Major fragments
NQO	222.63	223	224
(ACNQO) <sub>2</sub>	502.17	503	445, 387, 309, 293, 241
ACNQO) <sub>2</sub>	501.93	502	445, 438, 423, 405, 387, 383

Above data is depicted that the experimental data correlates to Theoretical molecular weights.

### 3.1.4 Elemental analysis

The elements Carbon, Hydrogen, and Nitrogen were evaluated using a CHN analysis. The sample is flash-combusted in CHN analysis and then oxidised into basic compounds, which are detected using a thermal conductivity detector or infrared spectroscopy. The elemental instrument was used to analyse the ligand and metal complexes, and the results are shown in Table 4. The findings were also compared to theoretical values.

Table 4: Result of Elemental analysis (CHN)

N analysis → Compound ↓	Carbon (%)		Hydrogen (%)		Nitrogen (%)	
	Theoretical	Experimental	Theoretical	Experimental	Theoretical	Experimental
NQO	45	49	7	5	58	46
(ACNQO) <sub>2</sub>	47.8	45.8	2.4	2.9	11.2	9.7
ACNQO) <sub>2</sub>	47.9	46.7	2.4	3.0	11.2	10.1

According to the findings of elemental analysis, the experimental values for ligand and metal complexes are in strong harmony with the theoretical values.

### 3.1.5 Metal analysis by ICP MS: Inductively coupled plasma mass spectrometry (ICP-MS)

ICP-MS (Inductive couple plasma mass spectroscopy) was used to determine the percent metal content, which was then compared to theoretical values and the data was summarised in Table 5.

Table 5: Result of Metal content by ICP-MS

Metal content Compound ↓	% Metal content	
	Theoretical	Experimental
(ACNQO) <sub>2</sub>	11.74	9.8
(ACNQO) <sub>2</sub>	11.69	10.1

Experimental results of metal contents are matches with the theoretical contents.

### 3.1.6 TGA and DSC study:

Thermogravimetric analysis (TGA) involves heating a sample to determine properties such as phase transitions, adsorption, absorptions, and desorption.

TGA was performed on all metal complexes (Thermo gravimetric analysis). The percent weight loss of the metal complexes was investigated in relation to the temperatures. The research was also expanded to include heat flow versus temperature, referred to as a DSC study.

Fig-4 and Fig-5 indicates the TGA for Co (ACNQO)<sub>2</sub> and Ni (ACNQO)<sub>2</sub>.

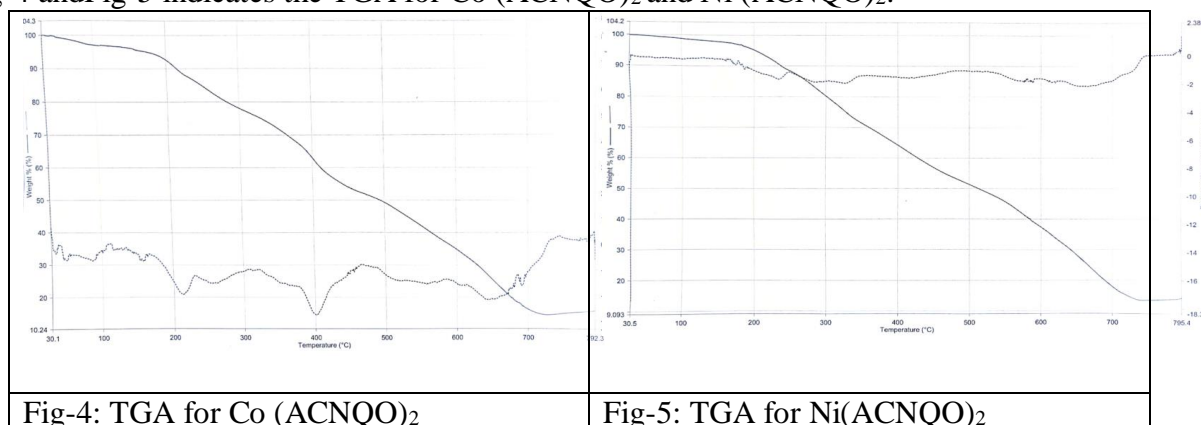


Fig-4: TGA for Co (ACNQO)<sub>2</sub>

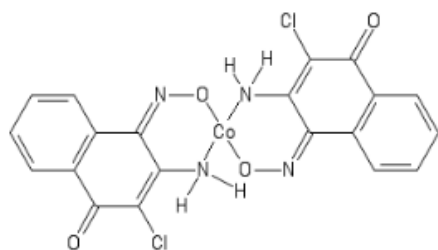
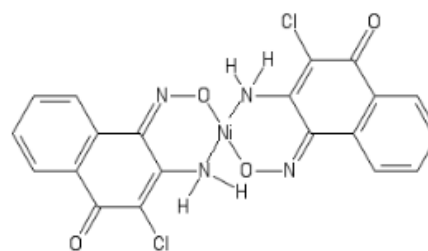
Fig-5: TGA for Ni(ACNQO)<sub>2</sub>

The results of TGA indicated that there is thermal decomposition with weight loss. Co (ACNQO)<sub>2</sub> and Ni (ACNQO)<sub>2</sub> shows the decomposition at higher temperature (about 700°C).

**3.1.7 X-ray diffraction study:** The study of X-ray diffraction patterns is often used to assess the crystallinity or amorphous nature of a material. Additionally, it can be used to determine the crystalline structure of a variety of compounds. This technique is widely applicable in the pharmaceutical industry and academia. Metal complexes were examined using X-ray diffraction, and it was discovered that all ligands and metal complexes are "Crystalline in nature."

Fig 6 show the structure of metal complexes.

**Fig 6: Molecular structure for Metal complexes [Co (ACNQO)<sub>2</sub>, Ni (ACNQO)<sub>2</sub>]**

Co (ACNQO)<sub>2</sub>Ni (ACNQO)<sub>2</sub>

### 3.1.8 Microbiological study

The microbiological properties of ligands and metal chelates were evaluated and compared to the behaviour of Cisplatin. The antimicrobial activity of the test material was determined using the Agar Well Diffusion Method. Bacterial cultures are cultivated on Nutrient Agar, while fungal cultures are cultivated on Chloramphenicol Yeast Glucose Agar. *Bacillus subtilis* NCIM 2063, *Staphylococcus aureus* NCIM 2079, *Escherichia coli* NCIM 2065, and *Proteus vulgaris* NCIM 2813 are bacterial cultures used to test the procedure. *Candida albicans* NCIM 3471, *Aspergillus niger* NCIM 501, *Aspergillus niger* NCIM 501, *Aspergillus niger* NCIM 501, *Aspergillus niger* NCIM 501, *Aspergillus niger* NCIM 501, *Aspergillus niger* NCIM 501, *Aspergillus niger* NCIM 501 Incubation temperature: 37°C; incubation time: 24 hours.

#### Method

Agar Well Diffusion Method was used to test the test material's antibacterial activity. Separately, a 24-hour-old culture of the listed species was prepared. sterile Nutrient agar plates for bacterial cultures and sterile Chloramphenicol Yeast Glucose Agar for fungal cultures were prepared. On separate plates, a 0.2 ml culture of each form of microorganism was spread with sterile swabs. On each plate, an 8.0 mm cork borer was used to prepare four or five wells in the agar. As a stock solution, a 10 mg/ml suspension of the test material was prepared in Dimethyl Sulfoxide (DMSO). Every well received 50 l of the stock solution. It was decided to use the stock solution. As a control, 0.5 mg/ml of cisplatin was used (Std). The plates were incubated for 24 hours at 37°C. The inhibition zone was measured in millimetres after incubation (mm). Table 6 shows antibacterial activity against specific species in terms of zone of inhibition in millimetres.

Table 6: Antibacterial activity of metal complexes:

Antibacterial activity → Compound ↓	Name of bacteria (Results :Zone of inhibition in mm)					
	<i>Bacillus subtilis</i>	<i>Staphylococcus aureus</i>	<i>Escherichia coli</i>	<i>Proteus vulgaris</i>	<i>Aspergillus niger</i>	<i>Candida albicans</i>
(ACNQO) <sub>2</sub>	14	22	12	0	20	0
ACNQO) <sub>2</sub>	8	21	0	0	18	0
Standard	0					

As compared to regular Cisplatin, the Cobalt metal complex exhibits strong antibacterial activity, as seen in the table above.

#### IV. CONCLUSIONS:

2-amino-3-chloro-1,4-naphthoquinone is a 2-amino-3-chloro-1,4-naphthoquinone derivative. The Co and Ni complexes of 1-oxime were synthesised. Elemental processing, FTIR, Electronic spectra, Mass spectroscopy, Thermogravimetry, X-ray diffraction, and ICPMS were used to classify these ligands and metal complexes. Metal chelates were discovered in crystalline form in nature. Microbiological activity was found to be superior to that of

standard Cisplatin, which was used as a control. Both structure elucidation findings are in good alignment with theoretical principles. The metal chelates decompose at high temperatures above 700<sup>0</sup>C, according to thermal analysis.

#### **V. ACKNOWLEDGEMENT:**

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## MESOIONIC SYDNONE: A STUDY OF THEIR CHEMICAL AND BIOLOGICAL PROPERTIES

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**ABSTRACT:**-Various literature sources have documented sydnones as important molecules with exclusive chemical properties and a wide spectrum of bioactivities. Sydnone can be defined as a five-membered pseudo-aromatic heterocyclic molecule. Classically, 1,2,3-oxadiazole forms the main skeleton of sydnone. The molecule has delocalized balanced positive and negative charges. The five annular atoms share the positive charge and the enolate-like exocyclic oxygen atom bears the negative charge. The hydrogen atom at the position C4 was proved to have acidic and nucleophilic functionalities making the sydnone ring reactive towards electrophilic reagents. These unique chemical features enable sydnones to interact with biomolecules resulting in important therapeutic effects like anticancer, antidiabetic, antimicrobial, antioxidant and anti-inflammatory. Consequently, we aim from the current article to review the available chemical and pharmacological information on sydnone and its derivatives.

**Keywords:**-Sydnone, Mesoionic, Heterocycles, Anticancer, Antimicrobial, Anti-inflammatory

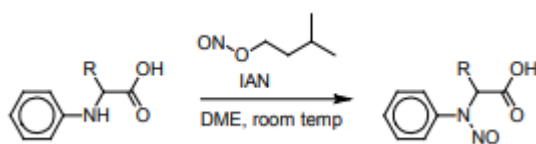
**Introduction** :- Sydnones are the most contemplated compounds among the mesoionic family because of their intriguing structures, chemical properties, engineered utility and biological exercises. Numerous reports expressed that one covalent structure isn't adequate to speak to the sydnone molecule agreeably. Notwithstanding, 1,2,3-oxadiazolium bearing a carbonyl capacity has as of late been the significant agent of sydnones in light of the fact that FTIR spectroscopy indicated a carbonyl stretch recurrence connected to C5 of the ring like in 4-acetyl-3-tolylsydnone which showed a solid band at 1783  $\text{cm}^{-1}$ . X-ray examination uncovered a bond length of 1.196 Å which compares to an exocyclic C=O twofold bond. Traditionally, the sydnone ring can be set up from the cyclization of N-nitroso amino acids with acidic anhydride. Afterward, numerous endeavors were utilized to improve the yield of cyclization by utilizing a more grounded drying out specialist, for example, trifluoroacetic corrosive anhydride or thionyl chloride. Since their first readiness, sydnones pulled in the consideration of therapeutic physicists and pharmacologists to examine their biological applications. Their recognized chemical structure empowers them to tie and deactivate an assortment of biomolecules like DNA and compounds. A tremendous scope of helpful properties has been exhibited including antimicrobial, calming, hostile to malignant growth, cell reinforcement and antidiabetic. The current survey shows the significant chemical and biological information on sydnones beginning from their initial discovery in 1935 until today. The sydnones are mesoionic compounds, right off the bat portrayed by Earl and Mackney in 1935.<sup>1</sup> The enthusiasm for this class of compounds was produced by their incentive as synthons in building heterocyclic complex molecules, just as their drug applications. 3, 4 Researchers from the Romanian Academy Center of Organic Chemistry have distributed a first paper regarding this matter in 1965 and from that point forward various examinations have been acted in the field of sydnone synthesis or their responses. 6-11 It discloses our contemporary enthusiasm to assess the condition of workmanship in sydnone synthesis, properties and applications. This survey will introduce the new investigates concerning sydnones portrayed into papers distributed after the audit of Browne and Harrity

## DEFINITION OF SYDNONE

The word sydnone was started from the expression "College of Sydney" where this class of compounds was first set up by Earl and Mackney in 1935. They recommended the arrangement of intertwined three and four-membered ring product (I) from the activity of acetic anhydride on N-nitrosophenylglycine which was later viewed as off-base by different chemists. Initially, a melded ring framework is probably not going to be shaped by a straightforward intramolecular reworking and would be an exceptionally stressed unsteady structure because of the presence of a  $\beta$ -propiolactone gathering. Hence, Baker and his teammate precluded the bridge bond and suggested a somewhat sweet-smelling five-membered ring and which was a hybrid of numerous zwitterionic structures. Furthermore, acid hydrolysis decays sydnone into hydrazine, carboxylic acids and carbon dioxide while hot fluid sodium hydroxide can return the sydnone into the beginning N-nitroso compound. These two realities demonstrate that the bicyclic framework proposed by Earl is far-fetched. Thirdly, different analysts demonstrated that acetic anhydride can change over the dextro-rotational N-nitroso-N-phenylalanine into the optically latent N-phenyl-C-methylsydnone. The loss of optical activity infers either racemization or an adjustment in the hybridization of C4 from a chiral  $sp^3$  state into an achiral  $sp^2$ . The oxygen atom joined to C5 was end up being in an enolate structure because of the quick arrangement of a monobromo subordinate in glacial acetic acid and bromine

## SYNTHESIS OF SYDNONE

Basically, sydnone was set up by Earl and his partner by the cyclodehydration impact of acetic anhydride on the N-nitroso subsidiaries of amino acids. They revealed that the disintegration of N-nitroso-N-arylglycine in abundance acetic anhydride at room temperature came about, after 24 h, in a sans nitroso, glasslike and stable heterocyclic product which was later alluded to as sydnone. The readiness of the N-nitroso halfway was cultivated by the customary nitrosation of the amino gathering of N-phenylglycine by the nitrous acid created from the response of sodium nitrite and hydrochloric acid. The N-nitrosation of N-phenylglycine in unbiased conditions was portrayed later by Applegate and Turnbull utilizing isoamyl nitrite (IAN) in dimethoxyethane (DME) at room temperature (Figure 1). They guaranteed that IAN was effectively used to set up the N-nitroso subordinate of N-(2-acetylphenyl) glycine with high return contrasted with the acid-based technique which prompted the arrangement of C-nitroso glycine



Afterward, Baker et al. reasoned the instrument of cyclization of the N-nitroso beginning material by losing a water molecule which includes four stages as introduced in Figure 2. Right off the bat, a blended anhydride moderate XV will be framed from the impact of acetic anhydride on the free nitroso acid whose carbonyl gathering will advance solid cationic properties. Of intrigue, it was discovered that utilizing a potassium salt of the N-nitroso-N-phenylglycine will definitely hinder the advancement of the moderate. Besides, a nucleophilic assault of the nitroso oxygen on the acid carbonyl gathering will prompt ring conclusion. Thirdly, an acetic acid derivation bunch is lost, and a twofold bond between the two nitrogen atoms is framed. Ultimately, loss of proton and development of enolic oxygen will create the last sydnone product

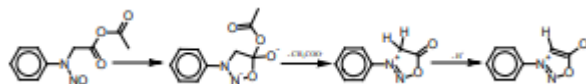


Figure 2: Mechanism of ring closure and sydnone formation

Notwithstanding, Eade and Earl found that the planning of some sydnone analogs, for example, nitro-containing sydnone took quite a while up to 7-30 d at room temperature with low to direct yields. They guaranteed that warming quickened the arrangement of sydnone ring, despite the fact that it decreased the yield because of fast hydrolysis of the product by the hot acidic response medium. Hence, Baker and his associates revealed unexpectedly a moment and complete division of N-arylsydnone in 90% yield when they utilized trifluoroacetic anhydride (TFAA) as a getting dried out specialist. The later engineered course had been effectively used to set up some confounded sydnones, for example, N, N-polyaliphatic bis-sydnone at a yield of 70-80%. Also, heat-labile sydnone, for example, 3-(2-methoxycarbonylphenyl) sydnone was set up in an extensive yield of 75% inside one hour utilizing TFAA in dichloromethane at 5 C. Numerous elective reagents were additionally utilized to set up the sydnone framework. In 1950, Baker et al. utilized thionyl chloride. They revealed that the change of N-nitroso amino acids into sydnone occurred inside a couple of moments utilizing thionyl chloride in dry ether at room temperature giving a low yield of 28%. Then again, utilizing thionyl chloride in a blend of cold dioxane and pyridine brought about an improved yield (75%) inside 25 min [6]. Some uncommon structures of sydnones were accounted for as surprising products of the cyclodehydration of the N-nitroso subordinates of  $\alpha\alpha'$ -iminodicarboxylic acids. For instance, 4, 4'-methylene bis [3-(2-cyanoethyl) sydnone] XIX was gotten from the impact of acetic anhydride on the diastereoisomeric blend of  $\alpha\alpha'$ -di-(N-2-cyanoethyl-N-nitrosoamino) glutaric acid XX. Despite what might be expected, the individual  $\alpha$  and  $\beta$  structures gave fundamentally the cyclic anhydride; N-2-cyanoethyl-N-nitroso-Lglutamic anhydride XXI. Similarly, the hydrolysis of the last cyclic anhydride in water at room temperature prompted an intramolecular improvement giving 3-(2-cyanoethyl)-4-(2-carboxyethyl) sydnone with 35% yield

## SYDNONES SPECTRAL STUDIES

**Ultraviolet (UV) spectroscopy:** The properties of the ultraviolet spectra of sydnones were very much surveyed by Stewart (23) and Kier and Roche (24). Quickly, ingestion maxima in the range 290-340 nm was considered as a proof of the presence of the fragrant ring of sydnone. Alkyl sydnone retains at the lower frequency (<300 nm). For instance, 3-methylsydnone, 3-n-butyl sydnone and 3-cyclohexylsydnone demonstrated their UV retention maxima at 290, 289.5 and 292 nm, separately.

**Infrared (IR) spectroscopy:** A study of the writing since their initial readiness until today uncovered two trademark IR bands for sydnones. The stretch of sydnone carbonyl (C5-O) ranges from 1740 to 1770  $\text{cm}^{-1}$  while the ingestion band of carbon-hydrogen (C4-H) was in excess of 3000  $\text{cm}^{-1}$ . In any case, electrophilic replacement at C4 prompted the loss of the carbon-hydrogen band and an expansion in the wavenumber of the carbonyl up to 1780-1830  $\text{cm}^{-1}$ . For instance, acetylation of 3-(4-chlorophenyl) sydnone brought about upshifting the CO band from 1750  $\text{cm}^{-1}$  to 1786  $\text{cm}^{-1}$

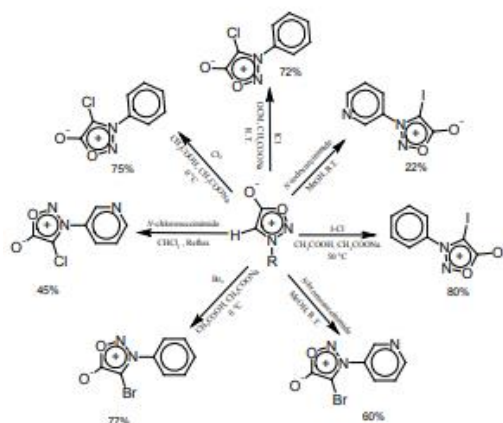
- I. **Nuclear magnetic resonance (NMR) spectroscopy:** Lawson et al. watched an abnormally high field resonance of the sydnone ring proton in a progression of 3-alkylsydnone and 3-arylsydnone when contrasted with the typical olefinic hydrogen. They restricted this deshielding phenomenon to the electron-pulling back impact of the neighboring nitrogen

and oxygen atoms alongside the anisotropy impact of the almost coplanar phenyl ring. Moreover, the positive charge and the sweet-smelling highlights of the sydnone ring brought about deshielding the phenyl ring protons, particularly the hydrogen atoms on the carbon  $\alpha$  to the sydnone ring. Another trademark part of the sydnone NMR spectra is the pinnacle of the carbon C5 which shows up in the least field of  $^{13}\text{C}$  NMR range, for example the carbonyl area. The chemical move of sydnone CO top changes inside a restricted range from 160-170 ppm paying little heed to the idea of the substituent at C4

**CHEMICAL PROPERTIES OF CARBON C4 OF THE SYDNONE RING**

**Acylation and formylation of sydnone ring:-** Greco and his colleagues detailed fruitless endeavors to acylate the sydnone ring in the traditional Friedel-Crafts response utilizing numerous impetuses, for example, aluminum chloride, stannic chloride, and phosphoric acid. Nonetheless, they effectively arranged an assortment of 4-acylsydnone subordinates when phosphorous pentoxide (3 equiv) was refluxed with one molar likeness carboxylic acid and sydnone. Afterward, different chemists conjectured that the disappointment of Friedel Crafts acylation was because of the coordination between Lewis acid and the exocyclic oxygen of the sydnone which inevitably yielded a sydnone-containing combined ring compounds instead of the ideal acylated product

**Halogenation of sydnone ring:** Many strategies were created for the presentation of incandescent lamp into carbon C4 of the sydnone ring. Chloro, iodo and bromo subbed sydnones were arranged effectively with a good yield as summed up in Figure 3. Until this point in time, fluoro-containing subsidiaries at C4 have not been accounted for. Nonetheless, Foster and his colleagues detailed 4-trifluoromethyl-3-arylsydnone from 3,3,3-trifluoro-2-(Nnitroso arylamino)propanoic acid with 75-85% yield



**Sydnone lithiation:** The preparation of 3-aryl-4-lithiosydnone is straightforward and can be achieved by n-butyllithium in tetrahydrofuran (THF) within one hour. Fuchigami and others reported that the 4-sydnonyl anion generated from 4-lithiosydnone in THF could react easily and selectively with various chemicals to introduce heteroatom groups at the C4 position as a sole product with an excellent yield. They found that 4-sydnonyl anion had less nucleophilicity features than the ordinary aryl anion and therefore the reaction with phosphorous acid esters, tin (II) chloride and antimony trichloride was not successful

### THE BIOLOGICAL ACTIVITY OF SYDNONE

The recognized structure of sydnone having positive and negative charges alongside its aromaticity and high lipophilicity empowers it to respond with biomolecules like DNA and proteins. Thusly, sydnones apply a wide cluster of biological exercises like mitigating, pain relieving, against joint inflammation, cytotoxicity, hostile to parasite (intestinal sickness and leishmaniasis), antidiabetic, cancer prevention agent, and antimicrobial and nitric oxide gift



[7]. In our current audit, we will zero in on the most examined and explored biological exercises. The main report on the calming activity of sydnone-containing compounds was in 1974 by Wagner and Hill who announced that sydnones bearing 2-arylthioethyl or 2-arylsulfoxyethyl at the position N3 were promising frameworks for planning new mitigating drugs. sydnones were additionally connected to other pharmacologically dynamic molecules to deliver more powerful cytotoxic operators. In this stream, sydnone-subbed chalcones were effectively orchestrated and fundamentally hindered the development of Ehrlich ascites cells and Dalton's lymphoma ascites cells.

**CONCLUSION:-**The wide range of chemical and biological properties of sydnone and its subordinates announced in various writing sources makes it of vital enthusiasm for chemists and pharmacologists. Immediately, sydnones were considered chemically and therapeutically versatile and robust molecules. They merit more investigation to outfit novel sydnone analogs connected to different substituents as expected platforms for the discovery of new medications.

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## THE STUDY OF PULMONARY AND EXTRAPULMONARY TUBERCULOSIS

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**ABSTRACT:-**Extrapulmonary tuberculosis (TB) represents approximately 15% of all TB infections. It is hard to diagnose on the idea of imaging characteristics and clinical symptoms, and biopsy is needed in many instances. Radiologists must be privy to the imaging findings of extrapulmonary TB to identify the circumstance in high-chance patients, even in the absence of energetic pulmonary contamination. In extrapulmonary TB, the lymphatic machine is most frequently affected. The presence of necrotic lymph nodes and different organ-precise imaging features increases the diagnostic possibility of extrapulmonary TB. Disseminated contamination and valuable anxious machine involvement are the maximum frequent manifestations in immunosuppressed patients. Renal sickness can arise in immunocompetent sufferers with very long latency intervals between the primary pulmonary contamination and genitourinary involvement. In several cases, gastrointestinal, strong-organ, and peritoneal TB display nonspecific imaging findings. Tuberculous spondylitis is the maximum frequent musculoskeletal manifestation. It is normally recognized late and influences more than one vertebral segments with extensive paraspinal abscess. Articular sickness is the 2nd most frequent musculoskeletal manifestation, and synovitis is its important imaging finding.

**Keywords:** - evaluation, pulmonary, extrapulmonary tuberculosis

**Introduction:-**Tuberculosis (TB) is a prime international health hassle and may also appear as a multisystem disorder. It is a chronic necrotizing bacterial contamination characterized by the presence of granulomatous lesions, caused by the Mycobacterium tuberculosis complicated. This consists of M. Africanum, M. Microti, M. Tuberculosis, and M. Bovis. M. Tuberculosis is liable for 97–99% of disease development. TB has two sequential techniques: infection and active sickness. Active disorder can develop throughout any period of existence in about 10% of the subjects who've been infected with the TB bacillus. The disorder may additionally involve any or all organs, however the lungs are the most commonly concerned (85%), and 50% of untreated sufferers die within 5 years after the preliminary contamination. According to the TB record of the World Health Organization in 2011, 39% of TB sufferers in Turkey had extrapulmonary TB (EPTB). Of all of the viable kinds of TB, the most not unusual is pulmonary TB (PTB), which has remarkable epidemiological importance due to its extraordinarily contagious nature. The percentage of sufferers with EPTB relative to the ones with PTB varies among international locations and relies upon on related sicknesses and ethnicity. EPTB involvement tends to growth in frequency if the immune gadget is compromised. Mycobacteria invade many organs at some point of primary infection, however these foci continue to be dormant (with out disorder improvement) if the host has an powerful immune machine. Reactivation is accelerated in patients with latent sicknesses, beneath conditions where the immune system is suppressed. The threat of EPTB and mycobacteremia will increase with advancing immunosuppression. Extrapulmonary involvement can be

visible in >50% of sufferers with concurrent AIDS and TB. EPTB includes TB of organs apart from the lung parenchyma, along with the lymph nodes, pleura, stomach, genitourinary tract, gastrointestinal tract, skin, joints and bones, or meninges. The prognosis of EPTB is extra hard than that of PTB. Its growing occurrence and severe sequelae due to the delay in prognosis lead to a considerable lower in labor pressure.

### **Pathophysiology**

Tuberculosis contamination is resulting from cardio micro organism, Mycobacterium tuberculosis. Mycobacteria have a cell wall with considerable amount of a fatty acid, mycolic acid, connected to a peptidoglycan-bound polysaccharide arabinogalactan, which provide a strong barrier proof against antibiotics and (herbal) defense mechanisms. Pulmonary tuberculosis is acquired in the course of airborne droplets that get into lungs and cause pulmonary contamination. Most of the bacteria are trapped in alveolar macrophages and destroyed. The mechanism of macrophages engulfment consists of complement cascade activation whilst protein C3 binds to the mobile wall and complements reputation of the mycobacteria by using macrophages. Mycobacterium phagocytosis initiates a cascade of events that consequences in both successful manipulate of the infection, accompanied by way of latent tuberculosis, or development to active disorder.

After macrophage engulfment, they present the mycobacteria to T cellular lymphocytes, which generate the formation of granulomas across the organisms. Granulomas have low tiers of vitamins that restriction mycobacteria increase and therefore manipulate the contamination. Those patients with decreased immune reaction fail to manipulate the infection and expand primary pulmonary infection.

### **Pulmonary and extra pulmonary tuberculosis**

Pneumonic illness is the most well-known type of tuberculosis spread, principally by the air borne course. In this way, it is normally just patients with pulmonary tuberculosis (PTB) who are irresistible. Various examinations and audits have featured the different variables related with infectivity. Analysis of PTB is generally straight forward, based on clinical and radiographic discoveries, and infinitesimal assessment of sputum examples. And still, after all that an acid fast bacilli (AFB) stain of sputum is positive simply in up to 75% of grown-ups with PTB than different structures tuberculosis.

By and large, lymph hubs are the most well-known site of EPTB; other influenced locales incorporate pleura, urogenital plot, bones and joints, focal sensory system (CNS), gut and additionally peritoneum, pericardium, and skin. Determination of EPTB presents difficulties because of variety of manifestations, low degree of doubts and because of the trouble in getting sufficient examples for affirmation. EPTB is a critical wellbeing quandary in both created and non-industrial nations. It is assessed that EPTB comprises 15 to 20% of tuberculosis cases all in all training among Human Immuno Deficiency Virus (HIV)-negative grown-ups in India.

The pervasiveness of EPTB in India shifts between 8.3% to 13.1% in various areas as indicated by an accomplice examination led by Central TB Division, Ministry of Health and Family Welfare in 2002 unique investigations show diverse example of EPTB site inclusion in created and agricultural nations. In an investigation in Calgary, Canada, lymph hub TB (43.5%) was found to most continuous type of EPTB followed by pleural (14.9%) and miliary TB (5.1%). An investigation from Madagascar demonstrated pleural TB (77.4%) to be the most well-known sort of EPTB followed by lymph hub TB (8.6%) and stomach TB (7.2%). In a comparable report from Hong Kong, the most well-known site included was pleura (41.2%) trailed by lymph hubs (36.5%), genitourinary (4.5%) and gastrointestinal parcel (3.5%).

## LITERATURE REVIEW

### **NIMALAN ARINAMINPATHY ETAL (2019)**

Systematic methods to monitor how a terrible amount of TB therapy is being used in the private region of India have been urgently needed: to both gain a strong view of the true scale of the issue and to help demonstrate progress in programs currently designed to address this problem. We used to have commercial records of rifampicin-containing tablets within the personal area, modified for insurance records and usage indications.

### **ADA KWAN ETAL (2018)**

History India has the highest tuberculosis burden (TB). Although the most TB patients in India are trying to find non-public treatment, nice TB care or its correlates may be subject to restrained evidence. We have applied SPs to study excellent adult TB treatment between fitness firms with an exclusive qualification in the Indias in two cities following our validation study for the standardized patient (SP) approach for TB. Pilot projects focused on private fitness in Mumbai and Patna, methods and findings during 2014–17, to improve TB regulation.

### **GEETA PARDESH ETAL (2018)**

1/2 of Indian TB patients seek private suppliers for care in the absence of full notification, various care and out-of-pocket expenses. The aim of this study was to explain the characteristics of TB patients who continue to be insured in public health care without being taken into account. Methods The use of logistic regression assessment was analysed in cross-sectional data from the National Family Health Survey four (2015–16). TB therapy becomes a variable dependant. Sociodemographic characteristics and where families are typically looking for remedies were impartial. Factors related to now not in search of treatment were age.

### **ROHIT KUMAR ETAL (2018)**

Multidrug resistant (MDR) and drastically-drug resistant (XDR) instances are increasing every day, that's an alarm for the Government agency to improve the control software. It has been seen that SNPT instances were growing day through days; consequently LPA can be a dependable diagnostic device to triumph over these trouble that may lessen the remedy delay and transmission. However, tradition ought to be followed in analysis of TB along with other test.

### **KARUNA D SAGILI ETAL (2018)**

In all its proposals, the Global Fund promotes organizational research (OR), but very few reviews explain this. In India, the Axshya project is funded by the Global Fund in order to increase tuberculosis services in marginalized and vulnerable communities in government and their visibility. The project Axshya has helped to develop OR potentials within the U.S. and has helped to tackle various priority studies issues, reported entrepreneurship and its outcomes and has shaped policy and practice.

### **RINKY THAKU ETAL (2018)**

Eighty-4 MDI steroid patients were monitored for 20 months in order to investigate the incidence of tuberculosis and the pattern of their tuberculosis and 78 patients were treated for bronchial allergies. As opposed to zero most people receiving MDI, five patients (5.5%) developed tuberculosis.

### **JOSÉ A. CAMINERO ET AL (2017)**

In the last 2 décadas, tuberculosis that is drug-resistant has become a global public health threat and a risk. Loads of tuberculosis are more difficult to analysis and cure, and prognosis will certainly get worse with the intensification of the resistance pattern. However, it is important to bear in mind that maximum of such patients can be cured with proper systematic scientific control. These guides outline the concept of prognosis and remedy for all people

that have tuberculosis, from the inflamed via lines that are susceptible to all medications, to those that are substantially resistant to medication. For all cases, specific guidelines are given.

### **Genitourinary tuberculosis**

Tuberculosis generally is going into the genitourinary machine after reactivation of previous obtained disease. This is the second one maximum not unusual presentation of more pulmonary ailment, following lymphatic unfold of contamination. Tuberculous bacilli infect renal and reproductive organs after they journey via the circulatory system. Genital involvement additionally happens by way of cutaneous lesions during sexual touch or by contaminated instrumentation.

Genitourinary involvement typically takes place after reactivation of latent disorder, and time to reactivation happens years after number one infection. Cases stated normally contain older patients with a mean age above 40 12 months vintage and mainly influences male patients. The urinary tract is commonly concerned and it could happen as a simple cystitis or pyelonephritis without or with hematuria and renal failure.

When renal characteristic is affected, the affected person has urinary tract obstruction or an interstitial nephritis. The prostate, seminal vesicles, and epididymis are hardly ever affected. Epididymis is the most commonplace genital organ involved in men accompanied with the aid of prostate. Testicles involvement may be very uncommon. In girls, fallopian tubes and uterus are the most not unusual genital organs worried and may motive infertility in small percent of young girls. Diagnosis is achieved showing evidence of bacilli in stain or cultures in urine or tissue received from the genitourinary tract. Granulomas and acid-rapid bacilli also can be seen in tissue specimens from kidneys and reproductive organs. Treatment is typically similar to pulmonary tuberculosis, with about 6–8 months as the advocated duration of remedy.

### **Cutaneous manifestations of tuberculosis**

Although uncommon, tuberculosis additionally has pores and skin manifestations. The same had been documented seeing that 1826 and takes place in 1–2% of the inflamed individuals. Cutaneous type varies, and it relies upon not handiest on medical appearance however also at the technique of contamination, predisposing factors, and pre-current TB publicity. The bacterial load may be variable, the identical can be without problems or difficult to stumble on. Mode of infection can be due to inoculation secondary to exogenous source, endogenous (preserve infection), or hematogenous unfold.

Exogenous inoculation can occur due to primary inoculation or due to tuberculosis verrucosa cutis (TBVC). Primary inoculation is rare and occurs after direct skin invasion of a preceding nonsensitized patient. Children of endemic areas are extra affected. However, surgical treatment with infected gadget, piercing, and tattoos has been recognized as causals. The infection is clinically obvious by way of the fourth week. The lesion progresses slowly, and local painless lymphadenopathy develops. The identical may additionally purpose sinus draining tracks following pores and skin perforation.

Diagnosis is predicated on the tissue sample, acid speedy, and subculture. If left untreated, the patient became sensitize to tuberculin test. Hematogenous unfold is feasible ensuing army sample. On the alternative hand, TBVC takes place after direct inoculation in a affected person who's already sensitized with TB. Children of endemic regions are at high risk and people who are occupationally related. In children, the buttocks and ankles are extra typically affected, while in adults, it takes place extra often at the hands and the dorsum of the hands.

It additionally affords with purple-brown painless but warty plaques that grows peripherally. Ulceration and nearby lymphadenopathy is not common, it can co-exist with bacterial infection. Diagnose may be assignment. Culture form the lesion is usually bad, tuberculin take a look at is effective, and interferon gamma assay might also play a role within the diagnosis. Biopsy superficial dermal pseudoepitheliomatous hyperplasia with hyperkeratosis

and microabscess inside the dermis or pseudoepitheliomatous rete pegs. The top and middle epidermis suggests inflammatory infiltrates of large and epithelioid cells. Patient normally responds to anti-TB remedy. If left untreated, lesions can also persist.

Cutaneous involvement may also be reasons through contiguous unfold offering as Scrofuloderma, tuberculosis cutis orificialis, and lupus vulgaris. Scrofuloderma are painless purple-brown nodules subcutaneously positioned maximum commonly at the axillar, neck, and groin regions. The infection happens because of direct extension of the infection from deep systems invading the skin. Cervical nodes are the maximum not unusual web page of infection. They tend to expand forming ulcers and sinus tracts and may also observe a line lymphoid distribution.

Although the contamination has been associated with *Mycobacterium tuberculosis*, it's been described in other in mycobacterial infections other than tuberculosis which includes bovis and following BCG vaccination. The lesion can be healed spontaneously, however it may take a long time to depart a scar. Lupus vulgaris can be advanced in affiliation to the later. Children, adolescents, and older adults are extra typically affected. Diagnosis is made by means of smear, tradition, and biopsy. Tuberculin test is normally nice, and concomitant pulmonary ailment is common.

Tuberculosis cutis orificialis (TBCO) is a unprecedented manifestation of characterized via painful ulcers with pseudomembranous fibrous base from a prior pink-yellow nodule with related inflammation. The lesion may be sited on the oral, nasal, or anogenital place. It impacts center age and older adults with increase immunodeficient ailment (cellmediated). Most of these sufferers have already got a progressive, pulmonary, gastrointestinal, or genitourinary strengthen TB disease. Tuberculin check is typically fine. Clinical path is typically terrible main to disseminated army TB. Diagnosis relies on biopsy smear and bacilli identity with the identity of them at the ulcer. The same is additionally associated with tubercular granulomas at the threshold of the ulcer and deep dermis. Lupus vulgaris consequences as a manifestation of TB reactivation. Is a continual manifestation which can arise by using direct extension, lymphatics, or hematogenous unfold? It happens more often on females than men, and it is the most not unusual for antique TB pores and skin manifestation in Europe. Despite this, it has a special distribution which varies with geographical region. For example, in western countries, the distribution is more commonplace positioned at the pinnacle and neck regions, whilst in subtropical or tropical areas is greater commonplace on the decrease extremities.

The skin lesion is red-brown papule that progresses into a nonpainful plaque. The same grows up to ten cm growing regions of atrophy with associated valuable clearing. There also are variations of the lesion, where it can develop hypertrophy and ulcerations. It may additionally infect with other infections. As may be liked in other kinds of granulomatous ailment, lesion may have a yellow-brown contour with "apple jelly" look. Diagnosis may be hard, because it can't be detected by way of lifestyle or histopathology. PCR performs a function within the identification of the mycobacteria. Although some cases have described, *Mycobacterium bovis* has potential pathogen. Pathology will show tuberculoid granulomas with primary caseated lesions. The epidermal area might also reveal atrophy acanthosis, hyperkeratosis.

Also, progression to pores and skin-associated cancer, consisting of squamous cellular carcinoma, has been documented. Skin lesion may also end result from hematogenous spread from primary website of infection main to metastatic tuberculous abscess, acute military TB, or lupus vulgaris. The first, metastatic tuberculous abscess happens after developing cellmediated immunodeficiency taking place in adults and malnourished kids. The abscess may be unmarried or more than one paperwork subcutaneous nontender nodules that development to ulcer and sinus tract formation without lymphadenopathy. Any part of the

pores and skin can be affected extra typically the extremities. The metastatic contamination generally confers a negative prognosis in the predispose individuals. Diagnosis is carried out after the findings of bacillus formation in way of life, smears, or biopsies. Histopathological, there's proof of adequate pores and skin necrosis, might also show granulomas on the epidermis. Unfortunately, tuberculin test results are variable.

Acute miliary TB is an unprecedented manifestation that takes place extra regularly in patients with deficient cellular-mediated immunity consisting of babies and bought immunodeficiency syndrome. Lesions are pinpoint purple-bluish or purpuric papules with related vesicles that furtherly grow to be crusted. The lesion may resolve within the following weeks leaving hypopigmented scar like tissue. Skin biopsy plays a function in the prognosis wherein mycobacteria are regularly diagnosed. TST is commonly negative.

Patient who have a higher immunity may additionally broaden allergic reaction reaction manifestation as tuberculid. The lesions may be papulonecrotic, lichen scrofulosorum, and erythema induratum of Bazin (EIB). The identification of a tuberculid is supported after the subsequent: presence of detectable contamination one of these TST and interferon gamma release assay, identification of granulomatous lesion in the skin, failure to pick out Mycobacterium tuberculosis in cultures and stains, and noted, the resolution of the skin lesions after anti-Tb treatment. Papulonecrotic tuberculid is the most common.

**CONCLUSION:-** Tuberculosis can invade nearly any organ through the lymphatic gadget and blood dissemination. The manifestations of greater pulmonary tuberculosis may be variable relying at the organ and the gadget involved. The diagnosis is made through a high suspicion inside the predisposed populations, and many times, sizeable diagnostic assessments that commonly involve cultures and/or biopsies of the inflamed tissue. This is one of the infectious affections with an extra range of displays, successful of pretending to be other noninfectious diagnoses.

Extrapulmonary TB stays a challenge to diagnose. Knowledge of the pathophysiology of TB in each organ and its imaging features can increase the detection charge in high-risk populations. The lymph nodes are the most frequently involved extrapulmonary organs. The presence of necrotic lymph nodes and other organ-particular imaging capabilities increases the diagnostic possibility of extrapulmonary infection. Extrapulmonary TB can occur irrespective of a patient's immune status.

Further exploration is expected to assess the PCR-DNA sequencing in outside of the problem area locale for identification of transformation design which could be utilized for elective TB treatment. In this investigation, an exceptionally high rate (22.2%) of smear-negative pneumonic examples demonstrated protection from first line drugs (INH and EMB). This requests utilization of option analytic modalities like BacT/Alert 3D and PCR based LPA for the early identification of medication safe bacilli. This features a disturbing circumstance, which infers that smear-negative PTB patients can hold drug safe strains than smear-positive partners. Sub-atomic investigation of M. tuberculosis separates is a basic initial step to creating atomic based location techniques for TB opposition. This investigation clarified the information on transformations that conceivably add to medicate obstruction in tuberculosis and establishes the framework for creating sub-atomic based tests to decide drug opposition in clinical detaches of M. tuberculosis.

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## PHYSIO-CHEMICAL INVESTIGATIONS OF GROUNDED WATER IN RURAL AREA OF BHIWANI (HARYANA) REGION

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### ABSTRACT

In present scenario, the drinkable water is secure enough to be used by human beings and create a problem for future time because of its excessive use. In present work the researcher examined the problem by selecting the samples in nearby locations of rural area of districts Bhiwani. Thereafter, the collected samples were physico-chemically examined by using various parameters such as temperature, pH, turbidity, odour, electrical conductivity (EC), total dissolved solids (TDS), calcium content ( $\text{Ca}^{2+}$ ), magnesium ( $\text{Mg}^{2+}$ ), chloride ( $\text{Cl}^-$ ), sulphate ( $\text{SO}_4^{2-}$ ), iron (Fe), dissolved oxygen (DO), Total alkalinity (TA) and Nitrate ( $\text{NO}_3^{2-}$ ) concentration existing in grounded water. The results of study reveals that the Tap water as supplied by Govt. of Haryana is almost same and quality of water is at satisfactory level in case of drinking water parameters so there is no need of further examinations. The grounded water examinations shows that ground water in domain of east of Bhiwani within 10km. are lightly polluted but within the limits of WHO protocols.

**KEYWORDS:**-Hand pump water, sites, quality parameters, physico-chemical parameters  
**INTRODUCTION**

Water plays a very important role for human beings. “*No life without water*” is a common proverb depending upon the truth that in nature water is the one of the physically occurring necessary requirement of all life sustaining activities[1] Since it is a active system, containing living and nonliving, organic, inorganic, soluble as well as insoluble substances. In the statistics, the WHO reports that approximately 35% of urban and 65% of rural Indian were without admittance to safe drinkable water [2]. Water has always been a considerable and life-sustaining drink to human and is necessary for the endurance of all known organisms [3]. It account for almost 70% of the human body’s weight. Almost 80% of the earth plane is covered by water state out of which only a small portion is available for utilization. The rest is sheltered in water bodies like oceans as salty water, polar ice caps, glaciers and underground [4].Water is an excellent solvent and picks up impurities simply. Unpolluted water is flavorless, colorless, and fragrance-free is often called the universal solvent. When gas carbon dioxide is dissolved in liquid water it gives very weak carbonic acid as a still better solvent product. Through soil and rock as water moves, it mixes very small amounts of minerals and holds them in solution. Magnesium and calcium dissolved in water are the most two common minerals that make water "hard." The measurement of the value of hardness becomes larger as the calcium and magnesium content increases and is correlated to the concentration of polyvalent cations dissolved in the water. Extreme groundwater mistreatment has resulted in lowering of water table in urban and rural areas of India. The parameters of water quality come to a decision the portability of water [5]. In order to assessment of water quality directory, we have carried out the physical and chemical assessment of hand pumps drinking water.

## MATERIAL AND METHODS

In the current study hand pump water samples were collected at 8:30 AM to 11:30 AM with necessary precautions in Polythene bottles from four different Locations of Tigrana village in district Bhiwani (**Table-1**). The Water samples were collected for the Estimation of various physico-chemical parameters like Temperature, pH were recorded by using Digital pH Meter and thermometer . The Electrical conductivities were calculated by using digital conductivity meter. The TDS values were measured by using the TDS meter. Iron, Calcium, Magnesium, Chloride, nitrate and sulphate were estimated in the laboratory by using standard laboratory methods. Current study involves the analysis of water quality in terms of physico-chemical methods [6].

Sample. no	source	Sampling location
1	Hand pump	Water Works
2	Hand pump	Shiv Mandir
3	Hand pump	Near Old Well
4	Hand pump	Tigri Lake

## RESULTS AND DISCUSSION

The Physical and chemical datas of the hand pump samples are collected in october 2018. The results of the samples vary with different collecting places due to the different character of soil contamination [7]. The physicochemical properties of water samples in the study region suggested that there was no destructive chemical contamination.

**Temperature:-** During temperature count of the water samples at the spot was found to be ranges from 22-24<sup>0</sup>C. The maximum permitted standard of drinking water is 25<sup>0</sup>C.

**pH:-** There was no considerable change in the pH value during the observation; the observed values were in the range 6.5 to 8.5 The pH value of drinking water is an important index of alkalinity, acidity and resulting value of the basic and acidic interaction of a number of its mineral and organic components.

### Total Dissolved solids (TDS)

Water containing more than 500 mg/L of TDS is not considered desirable for drinking water supplies, but in unavoidable cases 1500 mg/L is also allowed [8]. In the current study TDS value varies from 270 mg/L to 312 mg/L.

### Electrical conductivity (EC)

The observed electrical conductivity of drinking water samples of the well water was ranged from 170  $\mu$ S/cm and 210 $\mu$ S/cm. The obtained value after analysis when compared with the standard value is 300  $\mu$ S/cm of conductivity.

### Turbidity (in NTU)

Turbidity is due to the presence of colloidal substances arising from slit and clay during rainfall, or from discharges of industrial and sewage waste. Present work was done in locality of rural areas. The turbidity range set by WHO is 5 NTU and during present study it found to be 1.23 NTU to 2.10 NTU which is within the (5.0 NTU) WHO [9] permissible limit for portable water.

### Total alkalinity (TA)

Alkalinity is mainly due to carbonate, bicarbonate and hydroxide contents. The maximum and minimum alkalinity concentrations were found to be 12mg/L and 45mg/L. These values are below the WHO [9] acceptable limit of 250 mg/L.

**Chlorides (Cl<sup>-</sup>)**

The Concentration of chlorides ranged from 133 mg/ L to 152 mg/L. The values were within the WHO (200 mg/L) limit for chloride.

**Sulphate (SO<sub>4</sub><sup>2-</sup>)**

The Concentration of sulphate ranged from 88-110 mg/L. The observed values are within the permissible limit given by WHO (200 mg/L) for drinking water.

**Calcium (Ca<sup>2+</sup>) and magnesium (Mg<sup>2+</sup>) hardness**

The calcium hardness ranged from 45-59mg/L, whereas the magnesium hardness obtained between 21-40 mg/L.

**Dissolved oxygen (DO)**

Dissolved oxygen is most necessary parameter in water quality assessment and reveals the biological and physical processes prevailing in the water. The DO values indicate the degree of pollution in water bodies. In the current study dissolved oxygen ranged from 2.4-3.5 mg/L.

**Nitrates (NO<sub>3</sub><sup>2-</sup>)**

The concentration of nitrate in water samples is due to the nitrification activities of micro-organisms. The results observed below the standard value of nitrate given by WHO i. e. 6.20-16 mg/L [9].

**Iron (Fe<sup>2+</sup>)**

The concentration of iron in the bore well samples usually did not fluctuate. In present work bore well water samples, iron content lower than (0.3mg/l) mentioned by WHO [9]. Iron found in ground water is generally present in the ferrous or bivalent form (Fe<sup>2+</sup>). It is a rare element required by both plants and animal. Iron in water may be present in varying qualities depends upon the geological area and other chemical component of the water way. Iron is an essential element in human beings for nutrition. The minimum daily requirement of iron is ranged from about 10 to 50 mg/day [10].

**Table-2:** Physical parameters of water samples of selected hand pump water in Tigrana region, district bhiwani

Sr.No	Parameters	WHO	Water works	Shiv Mandir	Near Old Well	Tigri lake
1	Temperature (°C)	-	18	20	17	16
2	Odour	-	-	-	-	-
3	pH	6.5-8.5	6.9	7.2	7.3	7
4	Electrical Conductivity(μ S/cm)	300	170	181	204	210
5	Total Dissolve solid(mg/l)	500	312	310	289	270

Sr. No	Parameters	WHO	Water Works	Shiv mandir	Near old well	Tigri lake
1	Chloride(mg/l)	200	150	133	141	152

2	Sulphate(SO <sub>4</sub> ) <sup>2-</sup> (mg/l)	200	89	88	100	110
3	Calcium(mg/l)	75	45	50	59	49
4	Magnesium(mg/l)	50	31	40	28	21
5	Iron(Fe)(mg/l)	0.3	0.3	0.25	0.24	0.29
6	Nitrate(mg/l)	45	6.20	10	13	16
7	Total Alkalinity(mg/l)	250	12	18	19	45
8	Turbidity(N TU)	5	1.68	1.23	1.99	2.10
9	Dissolved Oxygen(mg/l)	4.0	3.5	3.0	3.2	2.4

### CONCLUSION:

Physico-chemical analysis such as temperature, pH, dissolved oxygen, total dissolved solids, Chloride, Calcium, Magnesium, Iron, dissolved oxygen, total alkalinity and nitrate, total alkalinity, sulphate and nitrate of hand pump water was carried out. Now the final conclusion of this research the physico-chemical characteristics of water samples in the study area suggested that there was no polluted content and no harmful chemical contamination.

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## FOETAL WELLBEING IN HIGH RISK PREGNANCY

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**Abstract-** Well-being can be defined in terms of an individual's physical, mental, social, and environmental status with each aspect interacting with the other and each having differing levels of importance and impact according to each individual. Pregnancy is an exciting ,very precious and critical period in women's lives .Well-being in HRP is a multidimensional and complex subjective concept which may change during pregnancy. It is integrated with the concept of health and is considered as the abstract understanding of health Well-being in high risk pregnancy refers to the successful control of physiologic parameters and successful control of physical health conditions .In other words, it denotes that the physical problems of HRP have been controlled and are bearable . A change in the different aspects of well-being of an individual may be reflected in an alteration of behaviour or the performance of a task or activity. This article includes the details of foetal wellbeing, high risk pregnancy , various antenatal tests to monitor foetal wellbeing in HRP and also include the timing of initiation of test because good access to healthcare services gives women with HRP the sense of well-being. Contrarily, limited access to diagnostic, therapeutic, and intensive care services are associated with fear, stress, and poorer well-being

**Key Words:-** foetal wellbeing, high risk pregnancy,physiological parameters, healthcare services, therapeutic and intensive care.

**INTRODUCTION :-** Pregnancy is considered as a very precious event as well as a critical period in women's lives because pregnant women experience different physical, mental, and social changes. Ineffective coping with such changes cause them serious problems. Although pregnancy is a physiologic phenomenon, some conditions may endanger maternal or fetal health and thereby, turn pregnancy into a high-risk pregnancy (HRP) and cause women to experience stressful conditions. Almost 22% of pregnant women face with HRP assessment of fetal well-being is designed to identify foetuses at risk for in utero death or asphyxia-mediated damage and affect expeditious and safe delivery. Antenatal foetal assessment is mandatory to avoid foetal death. It is helpful to ensure satisfactory growth and wellbeing of foetus throughout pregnancy and to screen out the high risk factors that affect the growth of the foetus. Using the biophysical profile score, a 60-70% reduction in stillbirth rates has been shown in tested populations. Perinatal fetal hypoxemia leads to irreversible tissue damage and is related to a myriad of problems for the neonate, child, and adult. Fetal asphyxia is proposed to be a contributor to cerebral palsy, learning disability, and adult-onset hypertension and cardiovascular disease. The goal of ultrasound surveillance of the viable foetus is to identify potentially damaging degrees of fetal asphyxia and initiate timed intervention. Maternal and fetal conditions that place the pregnancy at risk for fetal hypoxia include hypertension, preeclampsia, fetal growth restriction, maternal diabetes, maternal collagen vascular disease, umbilical cord anomalies, infection, and postdate pregnancy. Evaluation of fetal growth, amniotic fluid, fetal biophysical profile score, and cardiovascular/placental function are the ultrasound tools used for assessment of fetal well-being.

Fetal movement counting is a method by which a woman quantifies the movements she feels to assess the condition of her foetus. The recording of fetal activity serves as an indirect measure of central nervous system integrity and function indicating that fetal movements are a reliable sign of fetal wellbeing Fetal movement counting – often called 'kick

counting' Fetal movements have been defined as any discrete kick, flutter swish or roll. This is an indicator of fetal health and has been used By 20th week of the gestation. Most mothers are able to feel the fetal movements. 'Quickening' is the first point at which the women experiences fetal movements in early pregnancy. In primigravida, it may be felt from 18-22 weeks and in multigravida, from 16-20 weeks. The decreased fetal movement has been associated with poor pregnancy outcomes about 50% of women with still birth, they reported that they felt to gradual decrease of fetal movement before intrauterine death. At this current rate of India to reach the target of less than 39 per 1,000 live births by the end of 2015. In India every year. 1.34 million children was die before the completing five years, of which 7,48,000 die within the first months of their life. Since 75 percent of fetal death occur in the ante- partum should focus on reducing neonatal deaths It is estimated that 7.3 million perinatal deaths occur annually in the world to developing countries.

High risk pregnancy associated with different physical complications which in turn can cause mood changes and mental and social problems. Various studies showed that women with HRP experience negative feelings such as restlessness, fear, loss of control, disability, anger, and anxiety. Well-being is a widely-used concept in different disciplines, particularly in health-related disciplines.

**Antenatal foetal wellbeing**-Ensuring antenatal fetal wellbeing is one of the fundamental elements of modern obstetric practice. The mainstay of screening of fetal wellbeing using a tape measure to assess a surrogate of fetal growth, the symphysis fundal height, and informing the mother to report if she has concerns regarding fetal movements. It is well established that the symphysis fundal height is a poor marker of fetal wellbeing. It determines the lie or presentation of the baby (breech, transverse or cephalic), it provides us with information about the placenta location and appearance, it establishes an estimated foetal weight, it examines the umbilical cord Doppler flow to determine whether the placenta is functioning. Yet, there is no clear definition for wellbeing and controversies exist over its definition. Oxford dictionary defines wellbeing as "the state of being comfortable, healthy, or happy" with the three dimensions of physical, emotional, and psychological well-being. Similarly, Cambridge dictionary defines it as "the state of feeling healthy and happy". Mosby's medical dictionary defines it as the "achievement of a good and satisfactory existence as defined by the individual". In nursing, well-being is considered as personal satisfaction with health status as expressed by individuals. The World Health Organisation considers well-being as a keyword in the definition of health, with physical, spiritual, and social dimensions. It also uses well-being to define mental health as the following: "a state of well-being in which every individual realises his or her own potential, can cope with the normal stress of life, can work productively and fruitfully, and is able to make a contribution to his or her community".

**High risk pregnancy**-High risk pregnancy refers to pregnancy with an increased risk of adverse outcome in mother or the baby. Scoring the risk, will identify mothers at risk earlier, so that proper resource allocation, planned management or timely referral to higher centers is facilitated and thereby perinatal mortality or morbidity can be reduced. High-risk pregnancies (HRPs) are defined as those pregnancies with pre-existing or current conditions that put the mother, the foetus, and the newborn baby at higher than normal risk for complications during or after the pregnancy and birth. These include very young and older women, those with low levels of education and nutrition, as well as those with previous or current medical and obstetric complications and those in poverty or unstable living arrangements. HRPs should be identified as early as possible so that the patient can be given special care for her benefit and especially for the well-being of the foetus and newborn. Identification and management of high-risk factors initially and throughout pregnancy improve pregnancy outcomes for the mother and the newborn. Some predictors of HRP are maternal age (too young or too old),

primipara or grand multipara, previous obstetric difficulties, other medical conditions (e.g., HIV, hypertension, heart disease, diabetes, kidney disease, or mental illness such as depression), malnourishment, poverty, women who attend STI clinics, and use of cigarettes, alcohol, or other drugs. Risk factors may include social and economic factors such as adverse family circumstances, housing, financial status, and working conditions.

The medical and obstetric history provides evidence of previous risks such as frequent abortion, complications in pregnancy, or medical conditions that could affect the mother during the pregnancy or at the time of delivery. Pregnancy under the age of 16 or 17 or over the age of 35 should automatically define the pregnancy as being at higher than normal risk. Grand multi parity (i.e., more than five previous births) or a first pregnancy (primigravida) should also be considered as an extra risk for the mother, but more so for the newborn.

#### **Tests used to monitor foetal health in High risk pregnancy include-**

- **fetal movement counts-** Fetal movement counting is a way to check the health of a woman's unborn baby (foetus). It's often called kick counting. It's done by counting the number of kicks felt by pregnant women from baby in the uterus in a certain time period. By 20 weeks gestation, most women are able to feel their baby's movements. If women have a pregnancy with risk factors (e.g., high blood pressure, gestational diabetes, etc.) Women should do a kick count every day, starting at 26-32 weeks. The best time for counting is often in the evening, when babies tend to be more active. Mother may be able to feel the movements better if she lie down.
- **Non-stress test-** A non-stress test is a common prenatal test used to check on a baby's health. During a non-stress test, the baby's heart rate is monitored to see how it responds to the baby's movements. The term "non-stress" refers to the fact that nothing is done to place stress on the baby during the test. A non-stress test is recommended when it's believed that the baby is at an increased risk of death. A non-stress test may be done after 26 to 28 weeks of pregnancy. Certain non-stress test results might indicate that antenatal mother and baby need further monitoring, testing or special care
- **Modified biophysical profile -**The modified biophysical profile assesses fetal well-being by evaluating five variables: fetal heart rate reactivity, breathing movements, gross body movements, muscular tone and qualitative amniotic fluid volume. It combines a non-stress test with an amniotic fluid assessment that is performed using ultrasound. Ultrasound is used to measure how much amniotic fluid there is in four areas of uterus. Decreased amniotic fluid volume and spontaneous fetal heart rate (FHR) decelerations were considered abnormal findings during antenatal testing, and served as indications for delivery regardless of FHR reactivity. The modified profile seems practical for routine assessment of fetal well-being in high-risk pregnancy, and affords insights unavailable with ultrasound surveillance alone.
- **Contraction stress test-** The contraction stress test helps predict how baby will do during labor. The test triggers contractions and registers how baby's heart reacts. A normal heartbeat is a good sign that your baby will be healthy during labor. CST is usually safe, but it sometimes triggers early labor. The test is riskier for women who have placenta previa, a higher risk of uterine rupture, or who had a previous C-section. Women may get a contraction stress test at 32 weeks or later. Before that, the test may not be safe. The number of times, need the test depends on the mother's situation.
- **Doppler ultrasound exam of the umbilical artery-** Doppler ultrasound is used for noninvasive assessment of circulation in many clinical conditions. This technique has been used for studying most of the major fetal circulatory systems, including the umbilical artery (UA), umbilical vein, aorta, heart, and middle cerebral artery. Doppler sonography provides a unique opportunity to investigate fetal hemodynamics and to use these findings for fetal surveillance. In pregnancies complicated by placental insufficiency, meta-analyses of

randomised trials have established that obstetric management guided by UA Doppler findings can improve perinatal mortality and morbidity. Abnormal blood flow patterns in fetal circulation detected by Doppler ultrasound may indicate poor fetal prognosis

More recently, large research studies have demonstrated that the reporting of reduced fetal movements at term with subsequent delivery of the foetus, does not improve outcomes. CTG assessment is universally used and the more widespread introduction of computerised CTGs has made assessment less subjective. Ultrasound is also widely used to assess fetal growth, liquor and Doppler parameters. While no test is an entirely reliable in the prediction of fetal well being, when used together in the context of the clinical history, they can provide valuable information towards a bigger clinical picture of fetal wellbeing. Tests of fetal well-being may be indicated for patients who are at increased risk of adverse fetal outcome.

**Timing of initiation of testing should be based on:**

- Underlying medical issues and severity
- Maternal age
- Gestational age
- Obstetrical history

Antenatal testing should only be initiated at a gestational age and foetal weight at which, when necessary, delivery for an abnormal test result would be reasonable. The frequency and duration of testing should be determined by the obstetrical provider, testing should usually be continued until pregnancy is delivered, unless the clinical scenario improves.

**Conclusion-** Above content includes the information regarding foetal wellbeing in high risk pregnancy as foetal well-being directly depends on maternal well-being, so that changes in maternal well-being are associated with changes in fetal well-being. Poor maternal well-being can result in adverse neonatal and infantile consequences such as low birth weight, prematurity, increased neonatal mortality rate, hormonal and nervous changes, motor and behavioural disorders. The physical well-being dimension was one of the most common attributes of well-being in HRP. Physical well-being is necessary and important to achieve general well-being and health. This dimension refers to the successful control of physiologic parameters and physical health conditions Physical disorders can turn normal pregnancy into HRP .Therefore, physical disorders, perceived and expressed as ailment, are the first problems experienced by women with HRP compared with normal pregnancy. By knowing about the antenatal tests and timing of initiation of tests will reduce the foetal as well as maternal fatal risk during pregnancy.

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## Application of ICT Uses and E-Resources in Academic Libraries.

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**Abstract:-**The advent of technology has made the libraries to add new things to its collection. Print sources are more digitalized. E-resources information sources are very important for the academic community. Paper presentation an overview of these resources few advantages and some disadvantages and address of few web sites. This collected information through the ages has to be used for further research betterment and overall development of the society,

**Introduction:-**There are more useful due to inherent capabilities for manipulation and searching, providing information access is cheaper to acquiring information resources, saving in storage and maintenance etc. and sometimes the electronic form is the only alternative. The development in scientific publishing and the pricing policies of publishers posed new challenges and opportunities for academic libraries in purchasing and managing the serials within their restricted budget. The library and information service of the 21st century is fast changing. With the rapid development of electronic publishing, libraries are not only acquiring reading materials such as printed books and journals but also arranging for providing access to various learning resources in electronic form. An electronic resource is defined as a resource which requires computer access or any electronic product that delivers a collection of data refer to full text bases, electronic journals, image collection, other multimedia products and numerical, graphical or time based, as a commercially available title that has been published with an aim to being marketed. These may be delivered on CDROM, on tape, via internet and so on.

This has led to rapid development and popularity of electronic resources. E-resources are occupying a significant portion of the global literature.

**Definition:-**According to Bradman glossary, "A publication in digital format which must be stored and read on a computer device. There are two types: Direct access: these are physical objects such as CD-ROM, diskettes, computer tapes, and computer cards, containing text, image. This definition does not include electronic resources that do not require the use of a computer, for example, music compact discs and videodiscs. According to Library and Information Technology Glossary, 'Term used to describe all of the information products that a library provides through a computer network. According to Wikipedia, Electronic Resources means, "Information (usually a file) which can be stored in the form of electrical signals, usually on a computer, information available on the internet."

**Review of Literature:-**The paper traces e-resources in the college libraries. The college libraries under study have insufficient number of internet nodes, low bandwidth, poor collection of CDROM databases and online resources. The scholarly literature accessible under the UGC-Info Net, E-Journal Consortium is the only strength of these university libraries, as far as collection of re-sources is concerned.

These papers focused the formats preferred by the end users where it was documented that the users prefer the PDF rather than HTML format. Chisenga (2004) accepted out a review of the use of ICTs in ten African public Library services. The review found that, though most libraries had internet connectivity, very few were contributing web-based information services to their users. The study however, identifies four barriers to the useful facility of electronic resources in those libraries, namely: lack of planning: lack of sufficient or trustworthy financial support: lack of use of internet to supply information services to users and a lack of constant preparation for users in new information and communication technology services.

Jamali, Nicholas, and Huntington (2005) presented the conclusions of several studies that used log analysis to study the use and users of electronic journals. To set the scene for the study, a review of the literature was first undertaken, Attempts have been made to know the internet facilities, procurement of CDROM databases and online resources, participation in consortium activities and e-resources accessible through such consortium in the university in the university libraries.

#### **Selection of E-Resources:-**

The selection of E-resources should be done according to the need and demand of users. As a librarian one should consider the following steps at the time of selection.

1. To know content and scope of e-resources.
2. To know the needs of users.
3. To maintain cost effectiveness.
4. To examine quality of the e-resources and search facility among them.
5. To check either subscription based or web based at the time of purchasing.
6. To check the license copy.
7. To evaluate educational support and training.
8. To check the comparability and technical support.

#### **E-Resources Characteristics:-**

1. resources is quicker than print resources.
2. The software can help the users in retrieving the desired information.
3. Users can be guided to the document by providing a link.
4. Text easy search.
5. Electronic format can be collection of any media.

6. Ownership not that important.
7. Access to every document by anyone; from any where.
8. In electronic environment the interaction between user and librarian is frequent.
9. No defined user groups.

**Need of E-Resources:-**

1. Found easily.
2. To get access to an information source by the more than one users.
3. E-resources can be searched quickly.
4. Resources can be stored in huge amount.
5. Amount of time spent on the E-Resources use.
6. Analyses the purpose of using e-resources by respondent.
7. To collect , store, organize information in digital form.
8. To encourage co-operative efforts to save and share the investments in research resources, computing and communication network.
9. To promote efficient delivery of information economically to all the users.

**Type of E-Resources:-**

1. E-book: E-books is the many formats competing for prime, time ,including, adobe PDF, Microsoft Reader, e reader , mobipocket Reader, EPUB, Kindle and iPad.
2. E-Journals:-e-journals is very important part of every library collection, E-Journals are one application of information technology.
3. E-Newspaper :- An is also known s online newspaper or web new paper that exists on the World Wide Web or internet.
4. E-Magazines:- An E-magazine is very important part of every library collection E-magazines are one application of information technology.
5. Indexing and Abstracting Database:- Today are the reference sources which provide bibliographic information about journal including abstract of the articles.
6. Full text database :-These are many Dictionaries, Almanacs, and Encyclopedias, which are available on internet in electronic format.
7. Reference database :- These databases contain the numerical data useful for the mass community.
8. Statistical databases :- Due to advent of e-images facility this type of databases is developed.
9. Image collection:- Multimedia products.

10. E-thesis :- These databases are contained with PhD thesis and Dissertation published through e-format.

11. E-Clipping :- The main objective of e-clipping is retrospective search and comprehensive analysis of new items.

12. E-patents :- E-patents is the exclusive right granted by the government to make use of an invention for a specific period of time.

13. E- Standards ;- Written definition, limit rule , approved and monitored for complains authoritative agency.

### **E-Resources Utilities :-**

Now a days the reading materials and information sources are changing from print to electronic, some of such E-Information services are detailed and briefly discussed here :

1. CAS :- current Awareness Service.
2. SDI:- Selective dissemination of information.
3. EDDS:- E-Document Delivery Services.
4. OPAC :-Online Public Access Catalogue.

### **E-Resources on Library and Information Services.**

E-resources it has made simple and speedy purchase of information sources librarians need quick access to books, journals and electronic publication. Internet access is the simple and efficient method for access and updating the documentation and interface of catalogue of all libraries. The request for inter Library Loan (ILL) can be sent via e-mail and the photocopies may be sent by post fax, via e-mail after scanning the documents. Managing these electronic resources involves providing the library's user with convenient ways to find and access them and providing library staff with the tools to keep track of them. Most of the Library resources in the recent past are being made available in electronic formats such as e-journals, e-books, databases, etc. Libraries are moving from print to e-resources either subscribing individually or through consortia because of it advantages over print resources. As licensing electronic integrated library systems, separate databases stored on local computers or network.

### **Utilities of E-Resources:-**

1. E-publishing may be less costly than paper.
2. E-Resources are created in any file format like text, audio, video and images.
3. E-Resources are available for 24 hours of a day and save library space.
4. The E-resources search is easy because of user friendly interface.
5. They provide users faster, more convenient and anytime access from home, campus or library.
6. E -Resources can be reproduced, forwarded, modified and leading to problem with copyright protection and preserving authenticity.

7.The electronic environment enables to library to integrate with other libraries and make use of their resources also.

8.Those who have limited time to access to the libraries can effectively access to the libraries by dialing up process.

9. The libraries provide access to very large amount of information resources.

10. Libraries are focused on providing access to primary information.

**Conclusion:-**E-resources helpful to ensure exhaustive and pinpointed information. The e-resources provide themselves various search options to the user and library manages. Using of e-resources enable the library to save space of library and time of the users. E-resources are useful for libraries as well as each and every users of the society who are starving to get a variety of information through the globe. The developments in the information and communication technology services are available in the present made wonderful changes in the library operations. Its advantages are for technology services are available in the present made wonderful changes in the library operation. Its advantages are for technocrats, usage of the electronic products improve the knowledge of user. E-mails and RSS alerts carry the information for the individual to become aware of the user. Enhancement in infrastructure like high-speed network, WiFi in the campus , LAN portraits at various rights to use points in the campus and also in departments can be prepared to improve the practice effectively.

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# IMPACT OF STRUCTURED TEACHING PROGRAM ON KNOWLEDGE OF LIFE STYLE MODIFICATION IN CARDIAC PATIENTS FOR MAINTAINING HEALTHY HEART : A QUASI-EXPERIMENTAL STUDY AT JAYADEVA INSTITUTE OF CARDIOVASCULAR SCIENCES AND RESEARCH CENTRE BENGALURU.

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## Abstract:

**Background:** Cardiovascular disease is a chronic, major health problem and an epidemic in India; also having the highest burden of acute coronary syndromes in the world causing increasing number of deaths among the younger age group  $42.50 \pm 9.41$ (males),  $38.89 \pm 11.22$  (females), with overall incidence of 1.6% to 7.4% in rural, and from 1% to 13.2% in urban populations affecting the productivity of economy.

Life style modification through educational intervention is an essential weapon and forms the basis of primordial prevention of modifiable risk factors of CAD progression. A study was conducted with an overall Aim to assess the Effectiveness of STP on knowledge Regarding LSM for Maintaining Healthy Heart among Cardiac Patients in Jayadeva institute of cardiovascular sciences and Research, Bengaluru before and after administration of structured teaching programme.

## Method:

Quasi experimental (pre – experimental) consisting of one group pretest, posttest design, using purposive sampling technique was conducted to evaluate the knowledge of N=60 cardiac patients using an Interview schedule. Pretest was conducted and then immediately STP was given and then again conducting Post test for the same group after one week using same Interview Schedule to find out the effectiveness of STP.

## Results:

The statistical paired “t” value of 16.71, using SPSS v.18 was significant at 5% level ( $p < 0.05$ ), indicating the positive impact of intervention programme in post knowledge score. Overall knowledge enhancement was 26.1%, posttest knowledge score being 76.5% was higher than pretest knowledge score 50.5%. Hence the study concludes that individualized teaching program is effective and urges, every one should lead a conscious life style that prevents diseases.

**Key words:-** Cardio-vascular disease (CVD), Lifestyle modifications (LSM), Structured Teaching Programme (STP), risk factors, Healthy heart.

## INTRODUCTION

*“To ensure good health eat lightly, breathe deeply, live moderately,*

*Cultivate cheerfully and maintain interest in life”- Unknown*

Cardiovascular disease (CAD) is becoming a chronic, major health problem and an epidemic in India; India has the highest burden of acute coronary syndromes in the world. CAD being epidemic and chronic in India is increasing number of deaths among the younger age group  $42.50 \pm 9.41$ (males),  $38.89 \pm 11.22$  (females), with overall incidence of 12.63 affecting the productivity of economy. The estimated prevalence of CAD in India is currently about 3% in rural areas and 8% to 10% in urban zones. Several conventional and non conventional risk factors appear likely to have contributed to the acceleration of Coronary artery disease

epidemic in India (Fernandez 2008). The gravity of this situation is emphasized by a recent projection from the WHO and the Indian council of medical research (ICMR) which had predicted that India will be the MI capital of the world 2020 (Saeed Omar 2009). Majority of participants (58.6%) lacked the predefined good level of knowledge pertaining to modifiable risk factors. Knowledge on life style modification is a pre-requisite, pre-condition to implement progressing of CAD. Educational interventions are needed to make Indian public aware of modifiable risk factors of CAD (Saeed Omar 2009). Life style modification has been reported beneficial to CAD patients, delay the progression of disease and helps to maintain healthy heart (Abinav, 2006)

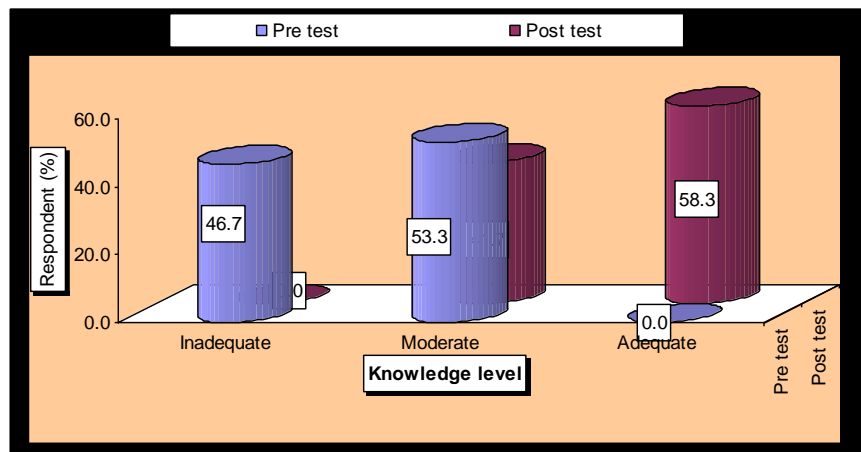
Investigation in the view of above aspects, lack of studies conducted in India related to the knowledge of life style modification for maintaining healthy heart in cardiac patients' and investigators experience and observation of lack of adequate knowledge among patients is an impetus for the study. Recently life style modification is being reviewed in India to form the basis of primordial prevention in CAD disease progression, hence Investigator felt the need for the study.

The over all Aim / Objective of the study aim of the study was to assess the Effectiveness of STP on knowledge Regarding LSM for Maintaining Healthy Heart Among Cardiac Patients in selected hospitals of Bengaluru", before and after administration of planned teaching programme.

**METHODOLOGY:-**Quasi experimental ( pre – experimental) consisting of one group pretest, posttest design was used to evaluate the knowledge of 60 cardiac patients using an Interview schedule in Male and Female General wards of Shri Jayadeva Institute of cardiovascular sciences and Research, Bengaluru using purposive sampling technique. Ethical approval was obtained and granted from the Hospital Research committee.. The participants were explained about the study and its significance, before signing the consent form. Pretest was conducted and then immediately STP was given and then again conducting Post test for the same group after one week using same Interview Schedule to find out the effectiveness of STP. The design did not include any control group hence evaluative research approach was used.

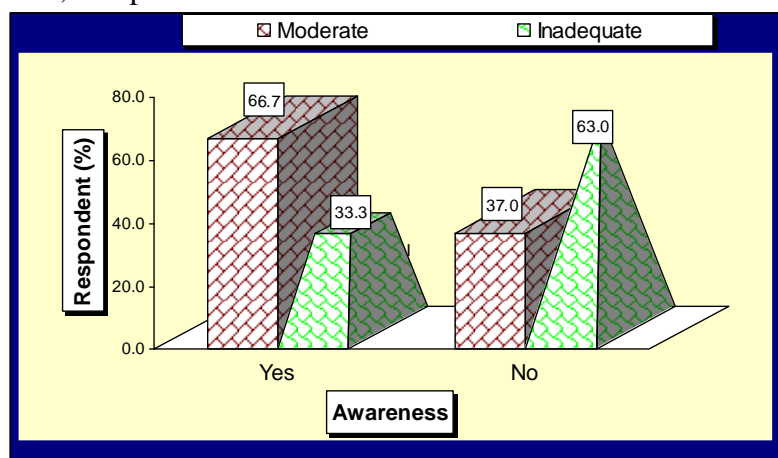
The constructed tool of interview schedule had reliability co-efficient of 0.936 and validity co-efficient worked to be 0.967 using split half technique with the raw score method. The STP developed was based on the topic of the study, review of the related research publications, non-research literature and objectives stated in the blue print. The draft of STP along with the criteria checklist was given to 12 experts in the field comprising of 8 nurse educators and 4 doctors. The experts were requested to validate STP based on the criteria checklist comprising the Objectives, Content (selection, Organization, Presentation) and Language. Changes were made as suggested. The STP was delivered in the local Kannada language. STP was conducted for a period of one hour on the same day. Overhead transparencies, flipcharts, chart, models, pamphlets were used as visual aids to facilitate easy understanding.

**RESULTS:-**The mean post test knowledge score of the cardiac patients regarding LSM for maintaining healthy heart was significantly higher (58.3%) had adequate knowledge, 41.7% had moderate knowledge, and 0.00% of the respondents had inadequate knowledge in comparison the pre test knowledge score.(0.00.% ) of the respondents had adequate knowledge, whereas 46.7% had inadequate knowledge, and only 53.3% had moderate knowledge about life style modification . Statistical analysis was performed using SPSS v.18. The statistical paired "t" implies that the difference in the pre Test and Post Test knowledge score found to statistically significant at 5% level (  $p < 0.05$ ), with paired 't' value of 16.71, there exists a statistical significance in the post knowledge score indicating the positive impact of intervention programme.



**Figure.1: Classification of respondents on knowledge level on life style modification.**

In relation to the demographic variables , the maximum numbers of subjects (36.7%) were from the age group of 46-55 years and (33%) were from the age group of 31-45 years) . 78.3% of the respondents was male, 21.7% were female. In relation to personal habits 58.3% of the respondents were smokers, 35% were alcoholics, 25% had pan chewing habit, although some of the respondents had multiple habits at the same time. Further in Presence of Risk factor 81.7% of the respondents mentioned stress as a risk factor, 71.7% smoking, 56.7% ,obesity 21.7% , diabetes 20% Hypertension . whereas in relation to Awareness on Coronary Artery Disease 55% were aware of CAD in comparison to 45%. Similarly, in relation to Source of Information on CAD 56.7 % of the respondents reported health personnel as their source of information, while 28.3% did not have any source of information on CAD, others 16.7% as TV, Radio, and print media.



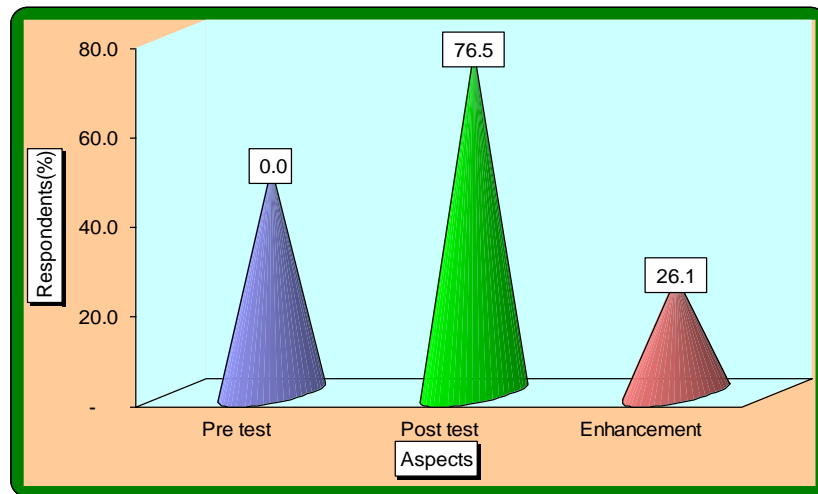
**Figure.2: Classification of respondents as per association between awareness on coronary artery disease aspect and posttest, pretest knowledge level on life style modification was significant at the level of 5%.**

Aspects	Max. Score	Respondents Knowledge			Paired 't' Test
		Mean	Mean (%)	SD (%)	
Pre test	40	20.19	50.5	13.1	<b>16.71 *</b>
Post test	40	30.61	76.5	11.9	
Enhancement	40	10.42	26.1	12.1	

**Table : 1 Over all Pre test and Post test Mean Knowledge on Life style modification n =60 \* Significant at 5% level t (0.05,59 df) = 1.96**



The table-1 reveals that the enhancement mean percentage obtained for overall knowledge was 26.1% with 't' value of 16.71% at  $p < 0.001$  level of significance. The calculated chi – square test results if 16.71 is higher than the critical value 1.96. Overall mean post test knowledge score 76.5% was higher than pretest knowledge score 50.5%.



**Fig 3.Over all Pretest and Posttest Mean Knowledge on Life style modification**

**DISCUSSION:-**Both the incidence and prevalence of risk factors are high at a young age in Indian population that is rapidly transitioning. The study revealed that Overall, a majority of participants lacked the predefined good level of knowledge pertaining to modifiable risk factors. In the comparison of pre and post test knowledge on LSM for maintaining healthy heart in cardiac patients revealed that the overall knowledge enhancement mean was 26.1 with standard deviation 11.9. The paired 't' test value was 16.71, which is highly significant at  $p < 0.001$  level of significance.

The present study findings are similar to others, **Xavier. D et al (2008)**, **Almas .A et al (2008)** mean age of patients was 57.5 and other associated illness like diabetes 23.7%, hypertension 40.2 % and 40.2 % were smokers indicating the higher rate of coronary artery disease in Indians attributable to life style changes. The identification of some of the risk factors of CHD has led individuals to realize that they have control of their own lives; that they have some power over their health status **Ahmed.H, Khan .H (2007)**.

Large scale efforts to improve general awareness about coronary artery disease and its risk factors and to promote healthy lifestyles should be undertaken and the consumption of tobacco products and unhealthy foods discouraged. **Karthikeyan G( 2007)**. Similarly modifiable risk factors are actually the corner stone in the prevention of coronary artery disease hence more seminars on awareness of risk factors of heart disease are required as an urgent need to target educational strategies to the population as in the present study (**Muhammad khan et al (2006)**).

Although CABG surgical procedure is not curative at the same time, when life style changes of risk factors are followed through more extensive and improved visual, formal, structured, individualized cardiac teaching program as in the study becomes a means of improving both the quality of life and the prognosis, **Purcell (2004)**, **Mckenna. K (2008)**, **Engelbrech et al (Dec 2008)**, **Singh(2005)**,

**CONCLUSION-**Life style modification is an essential weapon and beneficial to delay the progression of CAD, through which certain personal habits and risk factors comprising the health of heart are to be made major targets in the young people to lead a healthy life style.

The study findings shows that there is significant improvement in knowledge of LSM, STP has enhanced the knowledge of cardiac patients regarding life style modification for maintaining healthy heart. The Cardiac patient expressed that the teaching programme was very informative and it would help them to modify their life style as appropriate to maintain optimum level functioning their heart. Hence the STP is instructionally effective, appropriate and feasible.

#### **IMPLICATIONS:**

- Clinical Nurse Specialists can take the lead in constructing generalized teaching plans to be utilized in all hospitals to ensure that all cardiac patients are receiving the same adequate information. Public awareness can be created by various community health programmes especially for those less educated, from rural areas where there is gradient of urban to rural prevalence of CAD in the present days.

#### **LIMITATIONS OF THE STUDY:**

- The study findings cannot be generalized as the sample size was only 60
- The study was limited to cardiac patients who were admitted at Jayadeva institute of cardiology.

**FUTURE PERSPECTIVES:** - Cardiovascular disease is a chronic, major health problem, it is beneficial to conduct Time series studies to evaluate the long-term effect of STP and to assess the compliance of LSM and its effects, Experimental research approach having a control group, informing Nurses to update LSM based on evidenced based guidelines for their patients regarding required lifestyle modification to prevent complications of CAD and Replication with a large number of cardiac patients for generalizations.

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**“A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING UNIVERSAL PRECAUTION TECHNIQUE AMONG B.Sc. NURSING 1st YEAR STUDENTS OF BABA COLLEGE OF NURSING, CHINHAT, LUCKNOW.”**

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**ABSTRACT**

**Background**

Blood and body fluids may contain blood-borne viruses (e.g. Hepatitis B and HIV) or other bacterial and other viral pathogens. These can present a risk to other patients and health care workers. As it is not always possible to know who is infected with these pathogens, emphasis on infection control effort should focus primarily on 'universal infection control precautions' (UICP) which prevent the exposure to blood and body fluids, which are presumed to be potentially infective. **Objective:** The study aimed to assess the effectiveness of structured teaching programme on knowledge regarding universal precaution technique among B.Sc. Nursing 1st year students of Baba College of Nursing, Chinhath, Lucknow. **Methods:** The research design selected for the study was quasi experimental one group pre-test, post-test design. The questionnaire was developed and used for data collection to assess the knowledge. Sample of the study consisted of 40 B.Sc. Nursing 1st year students. **Result:** It revealed that the majority 16 (40%) had adequate knowledge and 20 (50%) had moderately adequate knowledge and 4 (10%) had inadequate knowledge. **Conclusion:** Hence it can be concluded that structured teaching program plays a vital role in increasing the knowledge level among B.Sc. Nursing 1st year students on universal precaution.

**KEY WORDS:** -Structure teaching programme, Universal precaution, Student Nurses

**INTRODUCTION:** -Universal precaution is the infection control technique that is recommended to control the infection. Universal precaution is a concept, which develops by centers for disease control [CDC]. Infection is the lodgment and multiplication of organism in the tissue of host constitutes infection. Cross infection when a patient suffering from a disease or a new infection is set-up from another host or external source.

“Universal precaution” is designed to prevent infection from inoculation; contact with mucous membrane such as mouth or eye, or through skin damage such as cuts.

Worldwide, three million HCW’s experience percutaneous exposure to blood-borne viruses each year [20, 000, 00 hepatitis B, 9, 00,000 hepatitis c and 300,000 human immuno

deficiency virus.]. Exposure to BBF can occurs through a percutaneous injury [needle stick injury NSI], or mucocutaneous incident.

This study is needed because as only currently 33.3 million people worldwide are living with HIV. Also 90% of infections are in the developing countries. This is why we need to aware the health care workers or future health care workers about the universal precaution techniques.

### **OBJECTIVES:**

- To assess the level of knowledge regarding universal precaution among B.Sc. Nursing 1st year students in Baba college of Nursing.
- To evaluate the effectiveness of structured teaching programme on knowledge regarding universal precaution.
- To find out the association between the posttest level of knowledge score with their selected demographical variable.

### **HYPOTHESIS :**

**H1:-**There will be significant difference between pretest score and post test score regarding universal precaution technique among B.Sc. Nursing 1st year students.

**H2:-**There will be significant association between pre test knowledge score with their selected demographical variables.

### **OPERATIONAL DEFINITIONS**

**Assess:-** In this study assessment refers to the organized and systematic process of collecting information about universal precaution from B.Sc. Nursing 1st year students.

**Effectiveness:-**It refers to gain in knowledge score of B.Sc. Nursing 1st year student regarding universal precaution after administration or the implementation of structure teaching programme.

**Structure teaching programme:-**It is a systematically developed structure question added with teaching aids designed for a group of student to provide information on universal precaution technique.

**Student Nurses:-**In this study student nurses refers to those studying for first year B.Sc. nursing courses in (selected Nursing college of) Baba College of Nursing.

**Knowledge:-**It refers to written response of participants regarding universal precaution technique, which is measured by questionnaire method.

**Universal precaution:-**Universal precaution refers to the practice in medicine of avoiding contact with patient bodily fluids by means of using barrier techniques in which wearing of

non-porous articles such as medical gloves, goggles and face shield, careful handling and disposal of sharp medical instruments.

**MATERIAL AND METHOD:****Research approach:**

Quantitative research approach.

**Research design:**

pre-experimental one-group pre test – post test research design.

**Variables :**

**Independent variable:** - Structured teaching programme.

**Dependent variable:** - Knowledge regarding universal precaution.

**Demographic data** -Age, religion, type of family, socioeconomic status, education of father, education of mother and source of knowledge.

**Research setting:**

The study was conducted in the baba college of nursing chinhat, lucknow

**Population:**

**Target Population-**B.Sc Nursing 1st year student from baba college of nursing chinhat, lucknow

**Accessible Population-**B.Sc nursing 1st year student who are present at the time of research study.

**Sample:**

B.Sc nursing 1st year student

**Sample size:**

Sample size comprised of 40 B.Sc. Nursing 1st year students

**Sample techniques:**

Non probability sampling (convenient sampling)

**Criteria for sample selection:****Inclusion criteria:-**

- B.Sc. 1st year students,
- Interested students.
- Willing to participate student.

**Exclusion criteria:-**

- GNM and ANM students.
- Students who were not willing to participate.
- Students who were not present.

**Tool and method of data collection:**

**Part 1.** Demographic variable.

**Part 2.** Multiple choice questions to answer the knowledge of universal precaution.

**Selection and development of tool:** Multiple choice questions was used for the study. Questionnaire is used to get exact and complete information from the subject. It was felt that questionnaire would encourage the subjects to give frank information and help in collecting data from literate subject. A questionnaire schedule was prepared to assess the knowledge level of students regarding universal precaution. The tool was developed after extensive review of literature , internet search and expert advice.

**Description of the tool:** The tool comprised of two part:

**Part 1:-**It consist of the demographic data of the B.Sc. Nursing 1st year students such as age, religion, type of family, socio economic condition, education of father, source of knowledge includes questions related to demographic data of universal precaution technique.

**Part 2:-**It consist of 20 multiple choice questions to answer the knowledge of universal precaution.

A score of “**one**” was given for every correct answer and score of “**zero**” was given for every wrong answers. The total score was converted into percentage and interpreted as follows.

Level of knowledge	Score
Adequate knowledge	76- 100 %
Moderately adequate knowledge	51- 75%
Inadequate knowledge	Less than 50%

**Reliability of tool:**

The reliability was calculated by Karl Pearson’s Correlation coefficient formula for estimation of reliability score was 0.86.

**Data collection procedure-** Before starting the study the researcher has obtained a formal permission from the Principal of Baba College of Nursing. Prior to data collection the investigator had obtain formal permission from the management after getting the permission, the nature and purpose of the study was explained to the students. The researcher initially obtains consent from each student the pre-test knowledge questioner was administered on each of the samples including the demographic data. On the same day the researcher had

administered STP for the student. The post test was carried out after the 7 days using the same questioner to know the effectiveness of structured teaching programme.

#### **Ethical consideration:**

Ethical Clearance will be obtained from the Principal of Baba College of Nursing. Consent will be taken from the study subjects after giving proper explanation of the purpose of the study. Informed consent will be developed in English as well as in Hindi language. Confidentiality and anonymity of the subjects will be maintained throughout the study.

#### **Plan for data analysis:**

The plan for data analysis includes descriptive statistics i.e. frequency, percentage, mean and standard deviation where as for inferential statistics, It includes the t value and chi square test.

## **RESULTS**

**Table-1 Distribution of subjects according to their demographic variables**

<b>S.NO</b>	<b>DEMOGRAPHIC VARIABLE</b>	<b>FREQUENCY</b>	<b>PERCENTAGE</b>
1.	<b>Age</b> a.19-20 yrs b.21-22yrs c.23-24yrs d.25 above	38 02 00 00	95% 05% 00 00
2.	<b>Religion</b> Hindu Muslim Sikh Christian	40 00 00 00	100% 00 00 00
3.	<b>Type of family</b> Nuclear Joint Extended	16 20 04	40% 50% 10%
4.	<b>Socioeconomic status</b> More then 5000 5000-10000 10000-15000 15000-20000	04 05 08 23	10% 12.5% 20% 57.5%
5.	<b>Educational status of father.</b>	01	02%

	Illiterate	08	20%
	12 <sup>th</sup>	15	37%
	UG	16	40%
	PG		
6.	<b>Source of knowledge</b>		
	Personal experience	10	25%
	During clinical posting	08	20%
	Mass Media	02	05%
	Other sources	20	50%

**Table1** described about the frequency, percentage distribution of demographic variable. Distribution of the subject by age revealed that majority of the subject, i.e. out of 40 participants 38 (95%) of them were in the age group of 19-20 years, 2 (5%) of them were in the age group of 21- 22 years. As per the finding of the study, the majority of the subject, i.e. 40 (100%) of them were Hindu. With regard to the type of family 16(40%) of them were from nuclear family 20 (50%) were from joint family and 4(10%) were from extended family. Out of 40 participants 10% students have more than 5000 income per month, 12.50% have 5000 -10,000, 20% have 10,000-15,000, 57.50% have 15,000-above. Out of 40 participants 2% student's fathers are illiterate, 20% student's fathers are 12th pass, 37% student's fathers are graduate, and 40% student's fathers are post graduated. With regards to source of knowledge 10 (25%) students have source of knowledge from personal experience, 20% have from during clinical posting, 5% have from mass media, and 50% have from other sources.

**Table2- Frequency percentage and distribution of samples on the basis of level of knowledge among B.Sc. Nursing 1st year students. N=40**

Level of knowledge	Range	Frequency	Percentage
1. Inadequate	0-6	04	10
2. Moderate	7-13	20	50
3. Adequate	14-20	16	40

Revealed that distribution of level of knowledge of B.Sc. Nursing students that 4 (10%) of them had inadequate level of knowledge, 20(50%) of students are having moderate level of knowledge, and 16 (40%) of them have adequate level of knowledge. it indicated that there



was an improvement in the level of knowledge among B.Sc. Nursing student after the structure teaching programme

**Table 3: Obtain range of score, maximum score, mean, median, standard deviation and mean percentage on level of knowledge of B.Sc. Nursing 1st year students.**

Range of score	Mean	Median	Standard Deviation	Mean percentage
8-18	13.2	14	2.5438	0.66%

**Table-4 Comparison of mean pre- test and post-test score:-. N=40**

Group	Mean	SD	"p" value
Pre- test	11.25	2.79	0.05 *** (s)
Post -test	13.2	2.5438	

**S\*\*\* significant at p < 0.05 level.**

**Association between level of knowledge and demographic variables.**revealed that there was no significant association between the knowledge score and the remaining variables such as age, religion, and type of family, education of father education of mother, socioeconomic status and source of knowledge except age and type of family.

### **Conclusion:**

The study finding expressed that the most of the B.Sc. Nursing 1st year student had moderate knowledge after the intervention of STP and there is no association between pre-test level of knowledge with selected demographical variables of participants.

### **Recommendations:**

- The same study can be conducted in different institution.
- The study can be done on small population
- Increased focus on nursing staff and nursing students through media channel, seminar and workshops.

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## Preventative measures to combat third wave of COVID-19 in India

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**Abstract:-** Coronavirus is mutating at a very fast rate and any kind of inactivity and carelessness may lead to serious complications. As the second wave has already served a lesson to us and there are many inputs and warnings given by the experts, based on that government should take immediate measures to prepare for the upcoming third wave. As already government are planning to keep sufficient stock of drugs, such as remdesivir, amphotericin B, tocilizumab, favipiravir, etc., and to provide complete training to the healthcare staff to ensure its rational use. Now this is high to implement all such plans to prevent the worst effect of third wave. Many states are making arrangements to protect children and setting-up coronavirus disease 2019 (COVID-19) care centres for them. Though most countries are started the vaccination process for children, India is still in the process of vaccinating adults. This article will suggest various measures by which Government can tackle the third wave of COVID-19 with less trouble.

**Keywords:-** COVID-19; third wave; vaccine; genome sequencing

**1. Introduction:-** In India, the first case of coronavirus disease 2019 (COVID-19) was reported on 30th January 2020, which was originated from Wuhan, China (Perappadan, 2020). A second wave began in March 2021 that was stronger than the first, with shortages of vaccines, hospital beds, oxygen cylinders and other medicines throughout the country (Safi, 2021). Throughout the Asia, currently India has reported the highest number of confirmed cases of COVID-19. India became the first country to report over 400,000 in a day on 30th April 2021 (Coronavirus, 2021). The second wave put major strain on the healthcare system due to ignored warnings that began in the first wave itself. In second wave people faced shortages of vaccines, hospital beds, drugs, liquid medical oxygen, and a lack of cryogenic tankers, which caused some COVID-19 patients to go to the black market (Pandey, 2021). The acute shortage of beds and oxygen led gasping patients dying waiting for oxygen and beds. The heart-breaking scenes, which have been witnessed outside hospitals where patients were dying without getting treatment, show the worst reality of healthcare infrastructure in India. The second wave is like a wake-up call for government to use it as lesson in many parts of country where the healthcare systems have to be improved considering huge population, untrained medical staffs, shortage of hospital beds and equipment. The current outbreak of COVID-19 is not going to end much too quickly and there is a high possibility of the third wave. This article will elaborate various measures by which Government can handle the upcoming wave of COVID-19.

Preparedness for the ongoing COVID-19 and its spread in India call for setting up of adequately equipped and dedicated health facilities to manage sick patients, while protecting healthcare workers and the environment as well as vaccinating the people at faster rate. In the wake of next wave, it is important that such facilities are kept ready during the pandemic period for training of health professionals and for managing cases of new mutants of coronavirus (Agarwal, 2020).

## **2. Suggestions and recommendation to prepare for upcoming wave of COVID-19**

The country as a whole needs such a plan for all critical care components including vaccines, making testings, drugs, healthcare staffs, identifying new mutant of virus, and medical equipment. It's true that our government is supporting us in all aspects but I would still recommend few things of which the below is to be considered first in the list.

### **2.1 Identifying new variant by genome sequencing**

During second wave, there are two variants of coronavirus have identified that are double mutant (B.1.617) and triple mutant (B.1.618). The 'double mutant' has a formal scientific classification B.1.618—with two mutations—the E484Q and L452R, which enable them to become more infectious as well as evade antibodies (The Hindu, 2021). The World Health Organization said the coronavirus variant, B.1.617, which is spreading in India as a “variant of concern”. Apart from this, a new variant of the virus causing Covid-19 has been detected in West Bengal. The 'triple mutant variant' is reportedly more infectious than other strains. A 'triple mutant variant' is formed when three mutations of a virus combine together. In this case, the three mutations involve a deletion of H146 and Y145 and mutation in E484K and D614G in spike protein. The 'triple mutant variant' is the second lineage of SARS-CoV-2 virus to be identified in India and is mostly circulating in West Bengal (India Today 2021). The virus is built by the instructions organized into sections, called genes, which are encoded by SARS-CoV-2 genome. Genomic sequencing is a process that is used to decode the genes and help to know more about the virus. Genomic sequencing allows to identify SARS-CoV-2 and monitor how it changes over time into new variants, understand how these changes affect the characteristics of the virus, and utilize all information to better understand how it might affect the human health. Routine analysis of genetic sequence data enables CDC and its public health partners to identify and characterize variant viruses—either new ones identified or those already identified abroad—and to investigate how variants impact COVID-19 disease severity and the effectiveness of vaccines, treatment, and diagnostic tests (Centers for Disease Control and Prevention, 2021).

As the COVID-19 pandemic enters its second year, it is very much important to keep a lookout for new and emergent strains and localized disease outbreaks. By exploiting advances in genomic epidemiology by monitoring and increasing sequencing efforts will help the country to identify new mutants and find the proper treatment (Srivastava et al., 2021).

### **2.2 Stocking medical equipment, drugs, and basic requirement**

India is known to be world's pharma capital, as low-cost quality drugs and medicines are readily available. But this has worked unfavorable for Covid patients across all spectrums of severity. During the second wave of COVID-19, patients were struggling to get proper drugs and oxygen even on the black market. Government should create a stock of drugs, including all the medicines that have been used for treatment, keeping the third wave of Covid in mind. Equally there should be proper stock of masks, gloves, hand sanitisers, personal protective equipment (PPE), and other medical devices to protect health workers against the virus. India has faced acute shortage of drugs for moderate-severe covid, especially remdivisir. Despite seven pharmaceutical companies produce this drug, the heavy demand has led to sorting, and being sold in the black market as high as six times the actual cost (Baheti, 2021). The government and health care system should work together to reduce hoarding of drugs, oxygen cylinders, and other medical equipments, and proper actions should be taken to punish the offender. However, Covid-19 has provided the healthcare system and its trustees a lifetime

chance to look inwards and seriously correct such systemic flaws, even if it involves radical changes.

### **2.3 Expansion of health workforce**

Healthcare workers are poised to play a significant role in fighting the pandemic, particularly in countries with less resilient health systems. Healthcare workers have been working as hard as they can since the start of pandemic despite the shortages, sometimes even when someone in their own family is sick or has succumbed to the disease. Among the real warriors who have emerged from this pandemic are the health care professionals who have risked their own health to serve their patients.

As the COVID-19 context entails workload modifications, reassignment, or recruitment, there is a need to provide adequate resource, training, equipment, and supervision to healthcare workers, using digital solutions if available. To promote the retention of health workforce there should be timely remuneration and reasonable working conditions during the COVID-19 response and beyond. The World Health Organization and the United Nations Children's Fund (UNICEF) (2020) have provided the following recommendations for handling health workforce.

- (i) Ensure the occupational safety and health of the community health workforce, all health staff should be provided with adequate PPE and trained in its use and safe disposal.
- (ii) By expanding the capacity of health workers. All community health workforce should be included in assessments associated with the COVID-19 response. Qualified workers should be identified, including unemployed and retired workers, who could be part of a surge companion.
- (iii) Management should calculate training needs and invest in rapid, remote training on new COVID-19 roles and tasks and adaptations to existing activities.
- (iv) Supportive supervision and communication modalities as needed to ensure the timely circulation of information and access to clinical decision support to strengthen newly acquired skills while fortifying referral association among the community health workforce, facilities, and district health management teams should be modified.

### **2.4 Scaling-up vaccination**

The best and most effective alternative to battle Covid is to vaccinate the population as quickly as possible so the majority would not need hospital care and hence not overburden the healthcare system. We can reduce the severity of COVID-19, if we vaccinate a significant portion of population and if we are careful about preventing it since beginning. We can control the third wave from being worse than the first two by vaccinating people with control measures such as containment and mitigation strategies. The labour force can be vaccinated in their industry and work places through scaling up of vaccinations. However, the national vaccination strategy remains inscrutable and non-transparent, as many vaccines approved by WHO are unavailable to Indians for unspecified reasons. If all proven vaccines are offered in countries with suitable cold chain capacity at affordable prices, then it will be easy to cover the full population within two to three months. Currently, Covishield and Covaxin doses are available to priority recipients throughout the country (The Hindu, 2021a). On 8th June 2021, Prime Minister announced that the Centre will provide free COVID-19 vaccines to all adults from 21 June. Modi said: "No state government would be spending anything for vaccines. Till now, crores of people got free vaccine; now the 18+ years segment will be added to this. Government of India will provide free vaccines to all citizens."

Getting people to take COVID-19 vaccine shots in some parts of rural part of country is proving to be a tough ask for officials allegedly due to a range of misconceptions circulating

about their side-effects. So, there is a need to provide proper guidance and awareness about the benefits of vaccination and getting rid of disease to the people staying in rural areas. In May 2021, the DCGI approved phase 2 and 3 trials of Covaxin among children aged 2–18 years.

## 2.5 Preparation to protect children

Since the cases of the second wave continue to reduce, the discussions about a potential third wave have already started. Many theories have come out claiming that children could be the most affected by the third wave of COVID-19. The Indian Academy of Pediatrics has also informed that although children remain prone to infection, it is “highly unlikely that the third wave will predominantly or exclusively affect children”.

In contrast, Dr Devi Prasad Shetty, chairperson and founder of Narayana Health, as well as chairperson of the Karnataka Task Force is convinced that a subsequent wave could affect children the most. As in the first wave, persons above 60 years of age were the most impacted and in the recent second wave a younger aged people were infected, and as the virus keeps mutating itself the next vulnerable group are children, he said in an interview, adding that there is a serious need to ramp up ICUs and beds for pediatric care in order to prepare for a third wave. He added that India has over 150–160 million children who are below 12 years of age. “There is a serious problem. If it happens, we should not run around like how we are currently doing because we did not anticipate the number of patients,” he said (The News Minute, 2021).

The screening of children of the age 2–18 years for the trial of India’s first indigenously developed COVID-19 vaccine, that is, Covaxin has started in AIIMS, New Delhi on 7 June 2021. The vaccine would be given to children after screening (The Hindu, 2021b). Managing children with COVID-19 in the ICU is ‘dramatically different from managing adults in the ICU, so it is advisable to vaccinate the parents of young children within upcoming months to prepare for the third wave. Government should work on setting up pediatric care ICUs and beds in India.

## 3. Conclusions

If the government of India is serious in combating COVID-19 third wave, then the first and foremost I would wish to suggest India should ban all the elections, meetings, gatherings, festivals, and many such events for next one year. This cannot, of course, be enough to control the infections, the main guidelines—masking, healthy distancing, and hygiene practice—are equally important, more so because the health system is not equipped to handle severe disease countrywide. Employers should also be encouraged to retain the work from home, staggered working hours, and 50% strength in work place protocols for at least another one year.

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## Use of Library with English and Other Language Literature: The Comparative Study

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**Abstract:-**The need of language can be realized best by those who suffer from the loss of speech, though it is beyond their power to explain it. In fact, we take speech for granted and are hardly aware of our interdependence upon it. It is difficult to conceive a society without it. Language seems to have born with the inception of the human race, so the credit goes to it for helping the survival of mankind. Not only this, it has also helped our race to mature by transmitting our culture and civilization to coming generations. This study is based on the usage of Library with English and Other Language Literature of the faculty members and research scholars of Jalgaon District. The scope of the study is limited to the usage of Library with English and Other Language Literature and to fulfill the teaching and research purpose of the faculties. It covers the availability of English and Other Language Literature in Jalgaon District. The one more important issue is come out from this analysis in which respondents were more interestingly responding about unavailability of the required reference at the time of need in other language literature specially.

**Keywords:-**Languages' Literature in Library, Traditional library

### Introduction

In countries where only one language is spoken, there is no problem for the child, because he has to develop proficiency only in one language. But, in a country like India where there is multiplicity of languages, there is the problem of intercommunication. This is the reason why in India normally a child knows two or three languages.

The seeds of English language were laid in Indian soil in the last decades of the 18th century. Charles Grant was perhaps the first person to plead for English language in India. He felt that the state of Indians was miserable and can only improve "if Indians were first educated and finally converted into Christianity." Later on, in the early nineteenth century in the regime of Lord William Bentinck English became the medium of instruction by the able advocacy of Macauley and support of Raja Ram Mohan Roy. Its use got extended to the political and cultural life of India as well as to business and commerce. English language slowly became the language of 'elite' class and of social prestige.

More than 25 million people living in the United States have limited proficiency in English, and they're disproportionately more likely to be living in poverty as a result. English language learners make up nearly 10 percent of all public school students in America. That makes supporting English Language Learning a top priority for school, public, and academic libraries alike. While patrons turn to libraries for help learning all kinds of languages, the need for English is apt to be more pressing and affect far more people than any other. Join this webcast to learn how innovative libraries of all sizes are meeting their patrons' need for not only formal instruction and self-directed learning tools, but underserved niches that make an immediate, practical difference

The need of language can be realized best by those who suffer from the loss of speech, though it is beyond their power to explain it. In fact, we take speech for granted and are hardly aware of our interdependence upon it. It is difficult to conceive a society without it. Language seems to have born with the inception of the human race, so the credit goes to



it for helping the survival of mankind. Not only this, it has also helped our race to mature by transmitting our culture and civilization to coming generations. The enormous development in various walks of our life has been possible only through language. Science, Technology, Religion, Art could make progress only with the help of language. Bloomfield says that each community is formed by the activity of language. Hence in order to know the culture of some people it is essential to know the language of these people.

### **Objectives of the Study:**

1. To study the use of Library with English and Other Language Literature
2. To compare the use of Library with English and Other Language Literature

### **Hypotheses of the Study:**

H<sub>0</sub>- There is no significant difference among the usage of Library with English and Other Language Literature  
H<sub>1</sub>- There is significant difference among the usage of Library with English and Other Language Literature

### **Scope of the Study:**

This study is based on the usage of Library with English and Other Language Literature of the faculty members and research scholars of Jalgaon District. The scope of the study is limited to the usage of Library with English and Other Language Literature and to fulfill the teaching and research purpose of the faculties. It covers the availability of English and Other Language Literature in Jalgaon District.

In the fast changing world; academic institutions are now responding to these global changes by adopting usage of Library with English mainly as compared to other Language Literature.

### **Research Methodology of the Study:**

The study is based on critical evaluation and analysis of basically Primary Data. The primary sources include faculty members and research scholars of Jalgaon District. A study is undertaken in the sampled regions to see its impact for which a detailed questionnaire is prepared to collect relevant information from the primary source for the guidance of the researchers. With the help of the questionnaire, detailed discussions were made with the certain sources of primary data to understand their views, thinking and attitude which would help to give the researchers useful recommendations, if any. The questionnaire is processed with the help of statistical tools like tabulations, grouping, percentages, averages, testing of hypothesis etc.

### **Research Area**

Researchers selected faculty members and research scholars from colleges from Jalgaon District. Sample sizes of 100 faculty members and research scholars from Jalgaon District. Researcher collects data through Primary and Secondary sources. Researcher distributed 100 questionnaires among the respondents.

### **Review of literature**

**English Language is a link language in Social Strata: A Critical Review by Ms. Neelam in International Research Journal of Social Sciences, ISSN 2319-3565, Vol. 2(5), 30-38, May (2013):** This paper is based on "English language is a link language in social strata: A critical Review" the author is of the opinion that English gives us glimpses of the various developments taking place in the world. It provides us distilled essence of modern knowledge in all fields of human activity. It is true to say that English has become one of the major languages of the world, and Indians can neglect its study at their own risk. It is through English that we have shared the wisdom of the west and the west has shared with us our intellectual and spiritual heritage. As we see that how English become a link language in India we just want to throw light on the condition of English before independence to the present days. It is a rich store house of knowledge. There is hardly anything important in

the world that has not been translated into English. The paper argues that language learning is one of the most important components of a good education. If we focused on present situation is given as an example of the universal need for language skills. Not least, it is emphasized that the world has changed dramatically as a result of improved telecommunications, rapid transport and the increasing movement of people around the globe as a result of migration and tourism. International treaties and education policies are cited that endorse the importance of language learning. English is of particular importance as the dominant international language.

English is everything that one can think of-the tool of empowerment and alienation, the way of bringing about equity and creating divisions, the mass instrument of education. Education is yet to take full cognizance of the onslaught of English. In the era of globalization, English has no longer confined to the four walls of a classroom-an affair between the taught and the teacher- but has been acclaimed as a link language for all human activities across the globe. Thus, far from being labeled as the language of the colonizers, it has today acquired the status of the international language, more so because of the globalization. Thus the knowledge of English Language has become a prerequisite for professional development in the modern world. English vocabulary encompasses almost all the subjects of sciences and humanities and all the emotions and expressions that human beings feel and conceive. The worldwide global markets have adopted English as their link-language for communication. The use of technology can and is reshaping the way we teach and learn. If we pay attention to the above problems and causes of English Language we should try to change the scenario of the teaching English Language from primary to Higher Education.

**Library Services to Non-English-Language Ethnic Minorities in the United States by NATALIA B. BEZUGLOFF in FALL 1980, LIBRARY TRENDS:** Fifty-five years ago a major survey of library services in the United States was made. The results of that study were published by the American Library Association in 1926 and 1927. Although approximately 1200 public libraries responded to the survey, the section dealing with services to the “foreign born” was based on fewer than 50 replies. According to the survey, librarians maintained contacts with a variety of immigrant organizations, welfare groups and knowledgeable individuals in the “foreign” communities. Twenty-eight of the libraries reported holdings in thirty-three foreign languages. Their combined book holdings included: French, 224,000 volumes; German, 210,000; Italian, 45,000; Yiddish, 37,000; Spanish, 35,000; Polish, 28,000; Czech, 25,000; and Russian, 24,000. In no other language were there more than 18,000 volumes. No major survey of library services to ethnic minorities has since taken place. Therefore, in order to obtain up-to-date information, a questionnaire was sent to major public libraries in every state which were most likely to have foreign-language collections. Based on information derived from this survey, public libraries in the United States have not only increased holdings of their foreign-language collections, but also have enlarged their scope of languages. Seventy-two public libraries surveyed have collections in more than seventy languages, even though some of the languages are only represented by token collections. The largest foreign-language collections are still found in urban industrial centers. While originally started to serve non-English-speaking immigrants, these collections continue to grow in order to serve ethnic communities as a bridge to their native languages and cultures, even though English has become their main means of everyday communication. The proliferation of many new language collections in smaller public libraries points to the awareness of and response by librarians to the needs of new immigrants or temporary residents.

#### **Limitations of the study**

1. The study is based on limited geographical area.
2. Further variables could be added for the purposes of detail study.

### Data Analysis

Researcher prepared the questionnaire for respondents and distributed it among them. After receiving the questionnaire researcher analyse the questionnaire.

Sr. No	Respondents	Questionnaire distributed	Questionnaire received	Questionnaire rejected (due to incomplete, wrongly filled etc)	Net Sample size for study
1	Faculty members and research scholars	100	89	6	83

### Testing of Hypothesis

**H<sub>0</sub>: There is no significant difference among the usage of Library with English and Other Language Literature**

**H<sub>1</sub>: There is significant difference among the usage of Library with English and Other Language Literature**

	<i>English Literature</i>	<i>Other Language Literature</i>
Mean	8.90	4.30
Variance	0.01	0.01
Observations	83	83
Pooled Variance	0.01	
Hypothesized Difference	Mean0	
df	164	
t Stat	366.78	
P(T<=t) one-tail	3.1963E-241	
t Critical one-tail	1.65	
P(T<=t) two-tail	6.3926E-241	
t Critical two-tail	1.97	

**\*\*Here level of significance is 0.05**

Thus, our null hypothesis “*There is no significant difference among the usage of Library with English and Other Language Literature*” is rejected. Alternatively we accept our alternative hypothesis “*There is significant difference among the usage of Library with English and Other Language Literature*”

### Findings

1. The most vital factor about usage of Library with English and Other Language Literature among the respondents’ perception is that, English is getting internationally acceptance day by day

2. The one more important issue is come out from this analysis in which respondents were more interestingly responding about unavailability of the required reference at the time of need in other language literature specially.

### **Conclusion**

From the above analysis, we can conclude that, whatever the situation may arise, the mindset of respondents' have not been changed as far as usage of Library with English and Other Language Literature is concerned.

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## Preliminary Phytochemical Analysis of Various Extracts Of *Mesua Ferrea L.* Seeds

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**Abstract**—Medicinal plants were used in the treatment of many ailments from remote time onwards. Many investigations on these medicinal plants were carried out and revealed the presence of numerous active principles responsible for its therapeutic potential. *Mesua Ferrea L.* is a classical ornamental plant and various parts of the plant were used for curing many diseases. This study mainly focus on the identification of those active principles which were contributing curative properties for this plant species. The four extracts of the seeds of *Mesua Ferrea L.* showed the presence of alkaloids, flavanoids, phenols, glycosides, saponins, steroids, tannins and terpenoids in varying concentrations.

**Keywords**— Flavonoids; phenolics; phytochemicals

### I. INTRODUCTION

Medicinal plants are the reservoir of active principles which are contributing promising therapeutic efficacy. Development of lead compounds from these plants opens a new era for the emergence of new drugs having less side effects compared to allopathic system of medicines.

*Mesua ferrea L.* Calophyllaceae family is a slow growing evergreen tree and is widely distributed in tropical countries. It is seen in Asian countries like India, Sreelanka, Andaman Islands, Myanmar, Indo-china, Thailand, Malasia and Singapore<sup>1</sup>. It is an ornamental tree with reddish brown to grey colored bark. Its leaves are initially red in colour and then changes to pale green when it is matured. It is having a white colour with floral fragrant flowers which contains numerous golden coloured stamens. The flower buds having different medicinal properties against fever, sweats, foul breath, bleeding disorders, small tumors, snake bite etc<sup>3</sup>. It can grow from 30-45m tall. It is commonly known as Ceylon iron wood, Indian rose, cheasenut or cobra saffron, nagasampige, nagesar, nagchampa<sup>5</sup>. Medicinally, the plant is used in various ailments like rheumatism, as an antidote for snake poison, for bleeding hemorrhoids, cough etc. Various literature reviews pointed out the presence of numerous active principles which are responsible for the above medicinal properties. The seed oil which was isolated from *Mesua ferrea* was used for skin diseases like itching, dandruff, skin eruptions etc. The flowers were used for dysentery, bleeding disorders,

rheumatism and iron induced lipid peroxidation. Seed decoctions of this plant were used for gastritis, bronchitis and for curing snake bite<sup>4</sup>.

## II. MATERIALS AND METHODS

### A. Collection of plant material

Plant material was collected from the village areas of Kottayam district of Kerala state. The collected plant materials were identified by Dr. Saju Abraham, Head of the department of Botany, Newman college, Thodupuzha, Idukki district, Kerala.

### B. Extraction

The collected seeds were shade dried and cleaned. And the coarsely powdered seeds were subjected for extraction by using soxhlet extractor for 72 hours with ethanol as solvent. The extract was concentrated by using a rotary evaporator and yielded a semi solid extract. The obtained semisolid extract was subjected to fractional separation using petroleum ether, ethyl acetate and chloroform as solvents. These extracts were used for the preliminary phytochemical analysis.

### C. Phytochemical Analysis

The four extracts prepared were subjected for phytochemical analysis for the detection of active constituents like alkaloids, flavonoids, phenols, glycosides, saponins, steroids, tannins and terpenoids.

Following tests are used for the analysis of phytochemicals present in the prepared extracts.

**Test for Alkaloids:**-Dragendorff's test- 8gm of  $\text{Bi}(\text{NO}_3)_3 \cdot 5\text{H}_2\text{O}$  was dissolved in 20ml  $\text{HNO}_3$  and 2.72g of potassium iodide in 50ml  $\text{H}_2\text{O}$ . These were mixed and allowed to stand. When  $\text{KNO}_3$  crystals out, the supernatant was discarded off and made up to 100ml with distilled water. The alkaloids were regenerated from the precipitate by treating with  $\text{Na}_2\text{CO}_3$  followed by extraction of the liberated base with ether. 0.5ml of alcoholic solution of extract was added to 2.0ml of  $\text{HCl}$ . To this acidic medium 1.0ml of dragendorff reagent was added. An orange red precipitate produced immediately indicates the presence of alkaloids.

**Test for Flavonoids:**-To 0.5ml of alcoholic solution of extract, 5-10 drops of dilute  $\text{HCl}$  and a pinch of magnesium chloride were added and solution was boiled for a few minutes. Presence of reddish pink or dirty brown color indicates the presence of flavanoids.

**Test for Saponins:**-In a test tube containing 0.5ml of aqueous extract, a drop of sodium bicarbonate was added. The mixture was shaken vigorously and kept for 3 minutes. Formation of a honey comb confirms the presence of saponins.

**Test for Phenols:**-Ferric chloride test- To 2ml of alcoholic solution of extract, 2ml of distilled water was added followed by drops of 10% aqueous solution of  $\text{FeCl}_3$  solution. Formation of blue or green color indicates the presence of phenols.

**Test for Steroids:**-Salkowski test- To 2ml of chloroform extract 1ml of concentrated  $\text{H}_2\text{SO}_4$  was added carefully along the sides of test tube. A red ring was produced in the chloroform layer indicating the presence of steroids.

**Test for Glycosides:**-A small amount of alcoholic extract was dissolved in 1ml of  $\text{H}_2\text{O}$  and aqueous  $\text{NaOH}$  solution was added. Formation of yellow color indicates the presence of glycosides.

**Test for Tannins:-**Ferric chloride test- To 1-2ml of aqueous extract, few drops of 5% ferric chloride solution were added. A bluish black color which disappears in addition of a few ml of sulfuric acid, with no formation of yellowish brown precipitate confirms the presence of tannins.

**Test for Terpenoids:-**To 2ml of chloroform extract 1ml of con.H<sub>2</sub>SO<sub>4</sub> was added carefully along the sides of the test tube. In presence of terpenoids, red color was produced in chloroform layer.( Harborne et al. 1999).

#### **D.Total Flavanoid Content**

Estimation of total flavanoid content present in the four extracts were done by spectrophotometric method. Stock solution of the extracts were prepared by taking 10mg of each extract and made up to 1ml with DMSO. 0.5ml of sample, 1.5ml methanol, 0.1ml aluminium chloride, 0.1ml potassium acetate solution and 2.8ml distilled water were added and mixed well. Sample blank was prepared in similar way by replacing aluminium chloride with distilled water. The absorbance was measured at 415nm using UV-VISIBLE spectrophotometer against the blank. The values obtained were interpreted using the standard graph of quercetin to get the milligram equivalents of quercetin.

#### **E.Total Phenolic Content**

Total phenolic content estimation was done for the detection of phenols present in the extracts. The phenolic estimation was performed by spectrophotometric method using FolinCio-calteau reagent. Stock solution of the extracts were prepared by taking 10mg of each extract and made up to 1ml with DMSO. Estimation was done by adding 5ml of FolinCio-calteau reagent to 0.2ml of sample. After 5 minutes of incubation, 4ml of 7.5% w/v sodium carbonate solution was added to it. It was stirred and incubated at room temperature for 2 hours. After 2 hours, the absorbance was measured at 750nm using UV-VISIBLE spectrophotometer. The values obtained were interpreted in the standard graph of Gallic acid to get the milligram equivalents of Gallic acid.

### **III.RESULTS AND DISCUSSION**

#### **III.a. Phytochemical Analysis**

A medicinal property of natural flora is due to the various secondary metabolites present in it. Phytochemical analysis of the plant extracts reveals the presence of those active principles. It will also leads to the development of new drug candidates by the identification and isolation of these secondary metabolites in its pure form. Alkaloids, flavanoids, phenols, glycosides, saponins, steroids, tannins, terpenoids, and proteins are the various secondary metabolites present in medicinal plants.

This study evaluated the presence of phytochemicals and its identification in four different extracts of *Mesua ferrea* seeds. Petroleum ether extract showed the presence of flavanoids, glycosides, steroids, tannins and terpenoids. Ethyl acetate extract showed positive tests for flavanoids, glycosides, steroids, tannins and terpenoids. Chloroform extract contains secondary metabolites such as glycosides, steroids, tannins and terpenoids and ethanol extract showed the presence of flavanoids, glycosides, steroids, tannins and terpenoids. The various medicinal properties of *Mesua ferrea* plant species can be attributed to the presence of these secondary metabolites

Table I. Phytochemical Analysis

Secondary Metabolites	PEE	EAE	CFE	ELE
Alkaloids	-	-	-	-
Flavanoids	+	+	-	+
Phenols	-	-	-	-
Glycosides	+	+	+	+
Saponins	-	-	-	-
Steroids	++	++	++	++
Tannins	+	+	+	+
Terpenoids	++	++	++	++

### III.b. Total Flavanoid Content

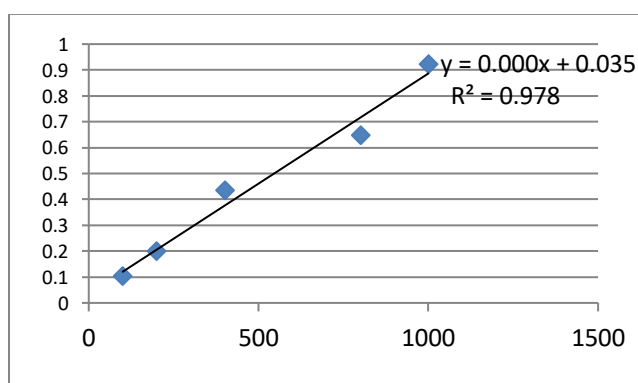
Amount of flavanoid in terms of quercetin units(mg/ml) of petroleum ether, ethyl acetate, chloroform and ethanol extracts of Mesua ferrea seeds were found to be 0.181298, 0.248544, 0.288912 and 0.1535 respectively(Table 3a &3b).

**Table3a. Estimation of total flavanoids of 3b. Total flavanoid content of various extracts standard Quercetin**

Concentration( $\mu\text{g/ml}$ )	Absorbance(415nm)
100	0.1025
200	0.1994
400	0.4338
800	0.6480
1000	0.9208

Extract	Absorbance (415nm)	Amount of flavanoid in terms of quercetin units(mg/ml)
Petroleum ether	0.2128	0.181298
Ethyl acetate	0.2786	0.248544
Chloroform	0.3181	0.288912
Ethanol	0.1856	0.1535

**Standard graph of quercetin**



### III.c.. Total Phenolic content

Amount of phenols in terms of gallic acid units(mg/ml) present in petroleum ether, ethyl acetate, chloroform and ethanol extracts were found to be 0.146818, 0.170091, 0.188727 and 0.124818 respectively(Table 4a&4b).

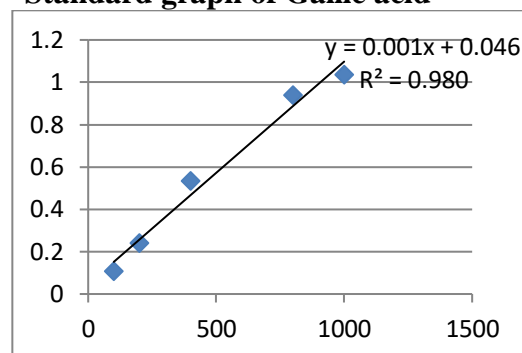
**Table4a. Estimation of total phenolic content of standard Gallic acid**

Concentration( $\mu\text{g/ml}$ )	Absorbance(750nm)
100	0.1091
200	0.2411
400	0.5352
800	0.9389
1000	1.0367



**Table4b. Total phenolic content of various extracts**

Extract	Absorbance	Amount of phenol in terms of gallic acid units(mg/ml)
Petroleum ether	0.2083	0.146818
Ethyl acetate	0.2339	0.170091
Chloroform	0.2544	0.188727
Ethanol	0.1841	0.124818

**Standard graph of Gallic acid**

### III. CONCLUSION

Phytochemical analysis of four different extracts of *Mesua ferrea* seeds proved the presence of various active constituents like flavanoids, glycosides, steroids, tannins, terpenoids etc. The presence of these active principles may be the reason for numerous medicinal properties of this plant species. Furthermore, isolation and characterization of these active principles are progressing. Estimation of total flavanoids was done by the extrapolation of the standard graph of Quercetin and the results showed the presence of flavanoids in the tested extracts. Estimation of total phenolic content was carried out by the extrapolation of the standard graph of Gallic acid and the results showed the presence of phenolic content in the extracts. Isolation and characterization of active principles, *Invitro* and *Invivo* anticancer studies, establishment of possible mechanism of action of these active principles are progressing.

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## **INTRODUCTION, ADVANTAGES AND USES OF WEDM - A REVIEW**

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**ABSTRACT-**Wire electrical discharge machining (WEDM) is a special form of the traditional EDM process in which material is eroded from the work piece by a series of discrete sparks between the work piece and the wire electrode separated by a thin film of dielectric fluid. The movement of the wire is controlled numerically to achieve the desired three-dimensional shape and accuracy for the work piece.

**KEY WORDS-**WEDM, EDM

### **INTRODUCTION TO WEDM**

Non Traditional Machining mechanics, machining technique components and also technological that clearly was really just a primary mechanical contact between the program and also the task part.

Non-conventional procedures are implemented rather than traditional techniques to get So, Traits. Conventional exceptionally challenging and fragile stuff. Machining procedures like drilling, turning, forming and grinding aren't proper methods to device exceptionally challenging and fragile stuff. Standard machining procedures might possibly have lots of complications in machining for example substances. Even in machining incredibly challenging and fragile stuff, traditional procedures Might Not Be viable, economical or satisfactory as a Result of next attributes:

It's tough to device complicated contours and gain intimate tolerances.

Machining procedures are named complex manufacturing procedures as they've been based in contemporary businesses. All these machining procedures utilize numerous energies like thermal, mechanical, chemical or electrical or chemical mixes of the energies to eliminate additional stuff. Additionally, unconventional machining procedures usually do not utilize sharp cutting edge gear.

Non Traditional manufacturing procedures Are Categorized by different This tool is much tougher compared to a job slice.

### **ELECTRICAL DISCHARGE MACHINING (EDM)**

Among unconventional machining procedures, EDM is implemented widely somewhat compared to several other procedures. EDM uses a thermo electric process where substance is eliminated from perform bit by employing heating electricity of sparks. Electric release will be replicated between 2 electrodes (work and tool slice ) at the clear current presence of

the dielectric liquid. The warmth of the spot under trigger boosts. Like a Consequence the substances inhale and melt from localized place using spark Vitality The consequence of electric release on substance erosion was first learned by Joseph Priestly at 1770 however has been perhaps not utilized at machining of compounds before 1930. Electrical conductive substances could be machined by EDM procedure. Even the EDM procedure can simulate tricky, difficult-to-machine substances. Pieces with elaborate, irregular and precise styles for hammering, media instruments, extrusion expires, hard internal contours such as aerospace and medical software might be created by EDM procedure.

### **WIRE ELECTRICAL DISCHARGE MACHINING (WEDM)**

Fever those results in massaging and melting surface stuff. The eliminated Of substance. The employed voltage Makes a station of plasma screen at the functioning gap Between work and wire bits which the release happens with significant stream of Between work bit and cable which can be immersed in de-ionized H<sub>2</sub>O. That Is a small difference Original WEDM was made from the SWISS organization'AGIE' at 1969. The very initial WEDM device functioned only with no disadvantage and cable choices had been confined by brass and aluminum just. Several studies have been accomplished on ancient WEDM to alter its own cutting edge rate and complete capacities. Recently, a lot of efforts were accomplished on wire-edam technology to be able to meet various fabricating conditions, particularly inside the accuracy mound and die marketplace. Cable EDM efficacy and endurance are enriched by advancement in various areas of WEDM these as for example caliber, precision, precision and performance.

Current ignite the place where release takes location is warmed to high Particles have been flushed off from the flowing filtered fluid. EDM works by using electro-thermal mechanics to minimize back conductive substances. Cable The substance removal mechanism from WEDM relies upon the melting and vaporization the Planet.

### **Application of Wire EDM Process**

Wire-edm procedure might be implemented in many businesses like aerospace, automotive, furnishings, medical, antiques business and renewable electricity. Additionally, WEDM procedure is just one of many most useful selections for generating large components, lengthy tubes, and large thick limbs and gears at 1 side . Unattended performance all day even days can be an ability for your own wire-edm apparatus.

### **ADVANTAGES OF WIRE EDM PROCESS**

Any electric running substances could be machined by WEDM procedure besides WEDM course of action might be implemented for fixing damaged components.

The following procedure has the capability to create complicated operate bits in various sizes and shapes. Its durability, endurance and brittleness. Physical anxiety is expunged throughout machining because there isn't any connection between cable and also work part. High price is obligatory for cable and machining. Answers. Additionally, Various cable types influence differently on different work part Substances and types will be also among those answers for operation advancement difficulty. Temperature raises throughout machining of titanium due of non-thermal Of wire-edam Procedure. The Standard of That clearly was a issue concerning the creation of re-cast coating on part surface. WEDM course of action shows fairly slow cutting down speed.

### **IMPORTANCE OF WEDM PROCESS IN PRESENT DAY MANUFACTURING**

The main goal of WEDM manufacturers and users is to achieve a better stability of the process and higher productivity. More exotic materials are developed, and more complex shapes are presented and conventional machining operations reach their limitations; the increased use of WEDM in manufacturing continues to grow at an accelerated rate. WEDM manufacturers and user emphasize on achievement of higher machining productivity with a desired accuracy and surface finish. Due to a large number of variables, even a highly trained operator with the art of WEDM is rarely able to achieve the optimum performance. The optimum utilization of the capacity of WEDM process needs proper selection of machining parameters. This part of literature review is aimed to investigate the effect of different process parameters on desirable output. WEDM is complex in nature and controlled by large number of parameters. The industrial sectors utilizing WEDM technology comes under five main categories: tool and die, power generation, aerospace, automotive, oil and gas industries. Unconventional machine tools including Electro Chemical Machining are generally considered to account for only 1% of total production. WEDM holds the largest share, possibly as much as 50% and ECM about 15% lagging behind laser processes which are 20%.

### **VARIOUS WIRE ELECTRODES USED IN WEDM**

In WEDM process, the cutting performance in terms of machining speed, surface finish, dimensional accuracy and wire breakage is dependent upon the quality of the wire electrode. The performance of the wire-tool depends on the following factors:

- (i) Electrical properties of the wire electrode,
- (ii) Mechanical properties of the wire electrode,
- (iii) Thermo Physical properties of the wire electrode,
- (iv) Cross sectional size and shape of the wire electrode

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## INFORMATION SEEKING BEHAVIOUR AMONG THE STUDENTS IN SELECTED LIBRARIES COLLEGES

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**ABSTRACT:-**Information Seeking Behaviour is one of the vital areas in consumer research. The reasons of users give raise to statistics needs and requirements. They may reap information thru the studies manner, that's the procedure of finding ideas, statistics, and new statistics via methodical study. It performs an essential position by way of connecting the studies pupils with cutting-edge and timely information. If the library experts remember that how the users are getting recognition about the library's traditional in addition to electronic sources and services, the library ought to make similarly efforts to reach the customers in an efficient manner. In this component, the existing have a look at has been undertaken and different factors like records needs, records use and in search of behaviour, go to the library, productiveness stage, pleasure on data sources, services and infrastructure facilities and group of workers mindset.

**Keywords:** information, seeking behaviour, students, selected libraries colleges

**INTRODUCTION:-**Information Seeking Behaviour is one of the critical areas in user studies. The motives of customers deliver increase to facts needs and necessities. To quench the pressure for facts, users take delivery of several ways and means to proper to apply the distinctive channels of communication of facts. Information explosion has paved the way to are trying to find facts, which is developing multiplicity at unique tiers, frequency, quantity and use. In this case it appears to be uncertain and varied in person, in order that data wishes of a specific institution of users and go with the flow of data from a specific situations /organization are special to conclude. Users require information for formation of decisions. They may additionally acquire records thru the research method, which is the method of locating ideas, data, and new information by methodical observe. Establishment and perpetuation of an aid well-to- do library with require based amenities and offerings are essential conditions for Universities. It plays an important role via connecting the studies students with present day and well timed records.

"Information, is actually the interaction or maybe reception of intelligence or knowledge, something obtained or maybe received through informing, the task by which the type of an item of expertise is actually amazed upon the apprehending brain and so as to bring about the condition of knowing". Information is actually reality; it's the stimulus which we see through the senses of ours. This info might be a single isolated truth or maybe, it might be an entire bunch of facts, though it's always device. It's a device of thoughts. It is able to have some dimension. It's that intellectual entity, which we receive, the foundation of knowledge "Information is actually an aggregate of facts or statement or perhaps that are conceptually interrelated".

## **INFORMATION SEEKING BEHAVIOR**

The growth of the idea of information seeking behavior may be known by understanding the origin of User Studies; after the user studies cover users' characters, needs, and dependency as well as pleasure degree by nature. Based on Wilson (1994) the term 'User studies' covers a broad range of research parts in Information Science, and which may be widened to add in areas of Computer Science, other areas and communication Studies. Its associated terms are actually information seeking conduct as well as information, must have. These terms have a varied range of trouble areas including Bibliometrics, User education, research of readership and reading and Information Retrieval Design as well as Evaluation. At the original stage, Mckinnie and Ayres (1916) conducted a library survey, and that is the very first trace of review in this particular course. Afterwards, the study of McDiarmid's (1940) 'library survey' referred to different sorts of surveys. These library surveys have been concentrating on exactly how individuals used libraries to fulfill the desires of theirs. The Conference of Royal Society of Information (1948) altered the road of the studies from library survey to user studies. Another Conference at international level was held by the National Academy of Sciences, Washington on Scientific Information (1959), concentrated on information requirements of scientists; and from there on a lot of studies on information seeking behavior of individuals belonging to a specific discipline, had been discovered to have been conducted. In India, the user studies had been highlighted by Ranganathan (1970) via the "Annotation of his on 'User's Survey'". Afterwards, studies in that course had been carried out by Panwar and Vyas (1976).

## **LITERATURE REVIEW**

**Gopal, Krishna and Kaushik, Ajay (2016)** The information seeking behaviour of the technical education Institute of Haryana, needs to be trained by conducting the information literacy programme. The lectures or the courses are needed to organize in order to give education to the user about the services and resources available in the technical education institute. Thus, this study concludes that the increase in information on the internet is greatly affecting the information seeking of faculty of technical institutes of Haryana.

**Garg, Manish (2016)**, "Information Seeking Behaviour Models: A Brief Introduction" The study reveals in brief introduction and outline of the information seeking behaviour and the information seeking behaviour models. In this study the information seeking of the students are studied and it is pointed out that the information seeking behaviour of the students varies from student to student. The students are not in the position to find the required information within the time period.

**Srivastava, Vishnu and Tiwari, Vijaya Raghav (2016)**, The information required by the law college should be specific to the point of the study or requirement to give the justices to the clients. The information seeking behaviors of the law college must have the good knowledge to retrieve the information for the library. The skill used to retrieve the information in the digital era should be effective and sound. The information required to fight against injustice is the best source for the students to gather the information.

**William, Abraham D and Tamizhchelvan, M. (2015)**, The lectures and publication of articles are the important purpose for accessing and referring information sources and services. The study emphasis on the electronic resources available to download and difficulty to download due to the speed of the internet is very slow. The speed of the downloading affects the publication work of the teachers. The study finds out the problems of information needs as "Information Overload" means extra work given by management without having proper communication of electronic media and lack of support from library staff.

**Kumar, Raja Suresh and Naick, Doraswamy (2015)**, This study revealed that there is a need to introduce the concept of information literacy in order to increase the information retrieval from the available resources. The services provided to the user should be explained

practically and theoretical knowledge should be provided to the user in order to work effectively to retrieve the information. The rules which are bound for the use of the electronic resource should be clear to the user at the beginning only so that there should not be any barrier to use the information resources.

**Singh, K. P. and Kumar, Moveen (2015)**, The purpose of this study is to investigate 120 foreign student's return, whose data were collected by using a structured questionnaire and self-administered students of their information needs, information seeking behavior of professional foreign students in Delhi University. About 88.6% of these students used seeking information from electronic resources and rarely used books.

**Kannappanavar, B. U. and Jayaprakash (2014)**The modern tools and techniques must be adopted by the Engineering College Libraries to serve the user community in the better and within the time period. In this study it is revealed that the staff power available in the Engineering College libraries are more than enough to provide the better services to the user, only that the staff should be trained to provide the better services to the user. The staff should be given training and workshops in order to inculcate the technological skill in them.

### **METHODOLOGY**

The quantitative examine technique turned into used for this observes the studies framework of the study. The unbiased variables of the take a look at are the statistics assets used, kinds of facts, person consciousness and person schooling. The dependent variable is the statistics needs. Based at the context of the observe which is the University Library, the library assets will be the internet, newspaper, on line database, text book, OPAC, library websites, dictionaries, guide, complete text magazine, encyclopedia, thesis and printed journal. Meanwhile, the library offerings include Inter-library loan and cutting-edge awareness services.

The tool and survey used for the information collection turned into a questionnaire. All of the respective questionnaires had been distributed randomly via easy random sampling. Simple random sampling method was selected due to reasons of it is the various maximum efficient approach in probability sampling design, without difficulty understood and as well as handy in realistic situation. This study hired a based questionnaire to obtain the respondent's remarks on their records needs and information looking for behaviour. The studies is a quantitative studies wherein it's far represented by means of time period "number validates" that's aimed toward trying out the hypothesis with numerical price instead explaining complex phenomena via verbal communication. The analytical a part of the studies became done using software called Statistical Product and Service Solutions (SPSS) version 22.

**RESULTS AND DISCUSSION:-**There are questionnaires were allotted to the scholars at the University Library. Out of the 274 questionnaires, 250 were back and completed, making the rate of go back of 91.2%. Based on the results obtained, 50% (one hundred twentyfive students) of the respondents are male and the alternative half is woman respondents.

The majority of the respondents are between age 18 – 26 years antique (74.4% or 186 respondents), accompanied with the aid of 23.6% (59 respondents) which might be elderly among 27 – 35 years vintage. Only 2.0% respondents are elderly among 36 –45 years old. In phrases of schooling level, 48.4% respondents are Bachelor Degree students, followed by using 26.4% of Diploma holders. In addition, the general public of the respondents are in Semester 2 with 24.4%, observed by way of 20% of Semester 4. The whole effects on the students' demographic profiling can be cited as proven next.

The questionnaire consists of questions about facts assets used amongst college students in University. In this segment, questions have been requested pertaining using records sources as illustrated. The locating shows the very best frequency is 157 with 62.8%, observed by way of slight with a frequency of 89 with 35.6%. The low frequency is 4 with 1.6%.



Students' statistics utilization styles are basically based totally at the types of the information itself. Therefore, libraries should have ok information assets with the intention to meet the genuine and statistics needs as in step with required via students. Table three provides the extent of Types of Information extracted from the survey findings. Based on the records analyzed, the excessive degree of statistics won indicates with the very best determines i.e. 167 (66.8%), followed by using moderate level, seventy seven (30.8%) and coffee stage, 6 (2.4%).

Library performs an essential function in promoting awareness of its services and sports in order to assist exposing and teaching the students with offerings and facility. Table 4 provides the degree of User Awareness. Based on the facts analyzed, the best frequency is again the excessive degree (55.6%), followed through mild (43.2%) and occasional stage of consumer cognizance (1.2%).

User training packages for college kids are crucial in growing more effective, green and impartial facts assets used and offerings that on hand inside the library. Table reveals the extent of User Education which showing the excessive stage dominating with 67.2%.

In the correlation coefficient price between Information Sources Used towards Information Needs is  $r=0.578$ . This price shows a mild advantageous relation among those elements. Furthermore, the correlation test become huge at 0.01 level of importance and the generated was regularly occurring. Thus there may be a slight fantastic sizeable courting among information assets used and information wishes at University Library.

The correlation coefficient among Types of Information in the direction of Information Needs shows slight price with  $r=0.681$ . Hence became standard wherein there exists slight wonderful relationships between kinds of data (TI) and data wishes (IN) at University Library. The comparable result is achieved among User Awareness towards Information Needs, with tremendous correlation but with weak power ( $r=0.360$ ) accordingly is commonplace. The relationships among User Education in the direction of Information Needs is shown to be mild with  $r=0.623$ . With this evidence, it can be concluded that there exists a superb moderate relationships among consumer schooling (UE) and statistics desires (IN) at University Library.

The success of any library depends to a big quantity on the selection of library resources. The decided on assets ought to meet the desires and necessities of the stop customers. Libraries and facts centers must take utmost care at the same time as deciding on and obtaining resources, maintaining in view the needs in their customers. The availability of useful resources inside the library will be useful to extra quantity of user to cater their data desires which in turn will increase the frequency of visits by using customers. This state of affairs will be useful for the libraries and could persuade the parent groups that their fund is applied efficaciously. The look at exhibits that Internet is the predominant supply of information, as it is on line and to be had every time from everywhere. Libraries should permit high stage net connectivity for supplying get right of entry to fine sources within and out of doors the libraries. Reprographic offerings ought to be furnished for users so that it will photocopy necessary substances not allowed out of doors libraries. The different maximum used services consist of Online Public Access Catalogue (OPAC), book borrowing and Selective Dissemination of Information (SDI) provider and maximum of college students are very lots happy with the facilities and the offerings.

Majority of the scholars are interested in maintaining up with modern traits in their concerned fields of observe. Libraries as such need to rent trendy strategies for dissemination of Current Awareness Services (CAS) and Selective Dissemination of Information (SDI) including Short Message Services (SMS), Instant Messaging, Bulletin Board Services and e-mails and so forth. This observes also located that most of the scholars aren't aware about the available sources and the means of using statistics retrieval equipment. Resources need to be nicely

organized and guided by using way of setting up modern day arrival racks at special locations within the library, right commercial of resources and many others. It is likewise cautioned that library experts ought to teach the scholars inside the e-surroundings as in step with the converting needs and must guide them in the use of varied data retrieval tools with performance.

**CONCLUSION:-**Information Seeking Behaviour (ISB) examinations have such a tremendous potential that such investigations are done occasionally on various kinds of clients. The current investigation was completed with a means to have a top to bottom comprehension of the information seeking examples of IT graduates in designing organizations and colleges in Delhi. Reactions in regards to different information seeking practices were gathered from IT graduates including students, and teachers. The investigation shows that IT graduates under examination have the propensity for genuinely seeking information for scholastic related educating, learning and exploration exercises. Despite the fact that countless of the respondents are being pulled in towards the Internet for information seeking exercises, the dominant part of them are of the view that libraries and printed resources are as yet applicable even in this time of advanced insurgency. IT is a field of study where propels in the field happen definitely and thus the IT graduates have the propensity for alluding to the most recent and refreshed information resources. IT graduates progressively incline toward electronic wellsprings of information to printed sources and the significant purposes behind this is that eresources give convenient access, support looking through abilities and permit far off and distant access. It is intriguing to note that in this electronic time, there are a few groups even in the field of IT who like to utilize printed wellsprings of information. Online data sets, subject gateways, e-diary consortia, and so on are additionally intensely utilized for the information seeking exercises of the IT scholastics.

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## **A study to evaluate the effectiveness of information guide sheet on knowledge regarding pneumonia in relation to COVID 19 among residents in selected areas at Mysore**

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**ABSTRACT:**-Every citizen those who are residing in a country are very risk for the development of pneumonia as a part of COVID-19 pandemic. The major reason to increase the mortality and severity of corona virus infection are as it affects the lungs in the form of pneumonia. It is unavoidable for the health authority to enhance the knowledge of the citizen to reduce the morbidity and mortality. A study was performed to assess the effectiveness of structured teaching program on knowledge regarding pneumonia in relation to COVID 19 among residents in selected areas at Mysore. One group pre test and post test study was conducted among the group of 50 residents of Kuvempunagar area at Mysore. The study reveals that the calculated post test mean score of knowledge were higher than the calculated pre test mean knowledge score. The study interpreted that the structured teaching program helped to increase the level of knowledge on pneumonia in relation to COVID 19.

**INTRODUCTION:**-Everyone those who lives in a society are more prone to get worsen with pneumonia as it is the most important complication of COVID 19. Education and continuous motivation of all the residents are essential to control not only the spread of pandemic but also helps to reduce severity by increased awareness. Home management will not help to treat the pneumonia but it helps to take cautious against development of pneumonia by corona virus. Especially the individual will never aware at the incipient stage and fall in to the complication which leads to death.

**NEED FOR THE STUDY:**-Education about corona virus and its complications are very essential that equip the person with appropriate knowledge and helps to adopt necessary measures to prevent it. It is very important teach about the pandemic and its adverse complications as it leads to transmission of disease from one person to another person directly or indirectly. Every individual must take necessary measures to prevent the development of pneumonia as it is the major reason for the severity of infection. Every day many new cases and death are informed around the world and it is said to be there is a chance to develop various waves so it is necessary to prepare everyone against the pandemic is very mush essential

### **OBJECTIVES**

1. To assess the level of knowledge regarding pneumonia in relation to COVID 19 among residents in selected areas at Mysore
2. To evaluate the effectiveness of information guide sheet on knowledge regarding pneumonia in relation to COVID 19 among residents in selected areas at Mysore
3. To find the association between levels of knowledge regarding pneumonia in relation to COVID 19 with selected demographic factors among residents in selected areas at Mysore

### **HYPOTHESIS**

H1 – There will be a significant difference between the pre test and post test knowledge on pneumonia in relation to COVID 19 among residents of Mysore

H2–There will be a significant difference in knowledge on pneumonia in relation to COVID 19 among residents of Mysore after the administration of information guide sheet

### **METHODOLOGY**

**Research design:** one group pre-test and post test design

### **VARIABLES OF THE STUDY**

**Independent variables:** Information guide sheet

**Dependent variables:** Knowledge regarding pneumonia in relation to COVID 19

**Demographic variables:** Demographic variables include age, sex, education, type of family, area of living, previous knowledge on COVID-19, previous history of respiratory infection and source of information

### **SETTING OF THE STUDY**

The present study was conducted in Kuvempunagar at Mysore

### **POPULATION**

In the present study target population include people living in Mysore and the accessible population includes 50 members from Kuvempunagara areas at Mysore

### **SAMPLE AND SAMPLING**

The sample of present study comprised of 50 residents living in Kuvempunagara areas at Mysore with the age group between 20-40 years.

### **SAMPLING TECHNIQUE**

Convenient non probability random sampling technique was used to select 50 residents for the present study.

### **SAMPLING CRITERIA**

#### **Inclusion Criteria**

1. Residents with the age between 20-40 years
2. Residents who knows English
3. Residents who have with any gender

#### **Exclusion Criteria**

1. Residents not available at the time of study
2. Residents not willing to participate in study
3. Residents who had severe health issues

### **DATA COLLECTION TECHNIQUE AND INSTRUMENTS**

1. Data on background variables of residents
2. Data on Structured knowledge questionnaires to assess the knowledge regarding pneumonia in relation to COVID-19 among the residents

Structured knowledge questionnaire prepared for the study includes 25 items to assess the knowledge of residents on pneumonia in relation to COVID 19. Each question has given with 4 possible choices. Each correct answer given by the sample acquired 1 mark and wrong answer given with 0 marks. The score obtained by the participant varied from 0 to 25. This score again split into different category base on the obtained score.

17-25: Adequate knowledge

9-16: Moderate knowledge

0-8: Inadequate knowledge

**DATA COLLECTION PROCEDURE:-**Official permission was obtained from the medical officer of Makkalakkotta PHC at Mysore. The information collected between 01/03/2021 to 15/03/2021. The participant explained about the purposes and importance of conducting the current study. All participants are ensured their privacy and taken a written consent to ensure the willingness to participate in the study. By adopting convenient non probability random sampling technique, 50 residents were selected for the study. The researcher developed a structured knowledge questionnaire to assess the level of knowledge regarding pneumonia in relation to COVID 19. 25-30 minutes were taken for each participant to complete the questionnaire. Information guide sheet which includes the contents on COVID infection and its complications was administered after the pre test and the sample were given one week time to read it and the post test was conducted by implementing the same questionnaire.

### **RESULTS**

#### **SECTION 1: data on demographic variable of residents under study**

**TABLE:** frequency and percentage distribution residents

**N=50**

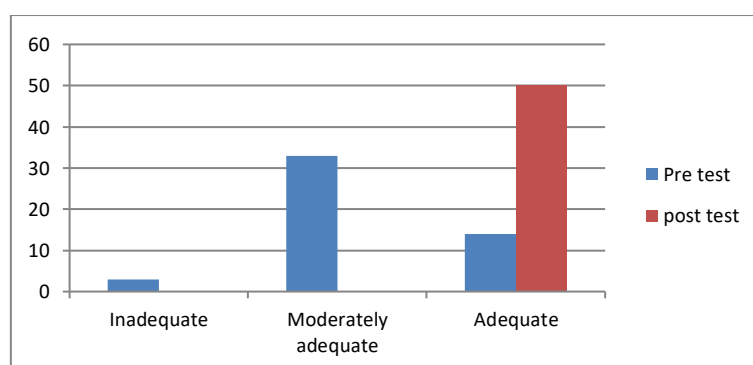
Background variable		Frequency	Percentage
Age in years	20-30	27	54%
	30-40	6	12%
	40-50	17	34%
Sex	Male	20	40%
	Female	30	60%
Education	Primary	2	4%
	Secondary	11	22%
	Higher secondary	6	12%
	Degree and above	31	62%
Type of family	Nuclear	47	94%
	Joint	3	6%
Area of living	Urban	17	34%
	Rural	33	66%
Experience on respiratory problem	Yes	6	12%
	No	44	88%
Previous knowledge	Yes	38	76%
	No	12	24%
Source of information	Television	11	28.95%
	Health worker	14	36.84%
	News paper	9	23.68%
	Friends	4	10.53%
History of Hospitalization	Yes	0	0%
	No	50	100%

**SECTION 2: Distribution of sample according to the level of knowledge.**

**TABLE:** Frequency and percentage distribution of pre-test and post-test level of knowledge

**N=50**

LEVEL OF KNOWLEDGE	PRETEST LEVEL OF KNOWLEDGE		POST TEST LEVEL OF KNOWLEDGE	
	Frequency (f)	Percentage (%)	Frequency (f)	percentage (%)
Inadequate [below 8]	3	6%	0	0%
Moderately adequate [9-16]	33	66%	0	0%
Adequate [17-25]	14	28%	50	100%



**Fig 1** simple bar diagram represents pre test and post test level of knowledge of residents regarding pneumonia in relation to COVID-19

**Table-3:** Overall mean, mean percentage, median and standard deviation of pre-test and post-test level of knowledge regarding pneumonia in relation to COVID-19 among residents

**N=50**

**Section III: Data on effectiveness of information guide sheet**

**H1:** There will be a significant difference in mean pre-test and post-test level of knowledge regarding pneumonia in relation to COVID-19 among residents

**SECTION 3: TABLE 3:** Mean, standard deviation, and mean percentage of pre-test and post-test knowledge score of residents

Knowledge score	Maximum possible score	Minimum score obtained	Maximum score obtained	Mean	Median	Standard deviation	Mean%
Pre-test knowledge score	25	4	19	12.78	14	3.395	51.12
Post-test Knowledge score	25	20	24	21.81	22	1.223	87.24

#### **SECTION 4: DATA ON EFFECTIVENESS OF INFORMATION GUIDE SHEET**

**H<sub>1</sub>:** there will be significant difference between pre-test levels of knowledge of sample regarding pneumonia

**TABLE4:** Overall mean, standard deviation (SD), mean percentage (%) and paired t value between retest and post-test.

**N=50**

Aspects	Mean	SD	Mean%	Significant difference in level of knowledge	Students paired t test
Pre-test	12.78	3.395	51.12	36.12	t=19.18
Post-test	21.81	1.223	87.24		

#### **SECTION 5: ASSOCIATION BETWEEN GAINS IN KNOWLEDGE SCORE WITH SELECTED DEMOGRAPHIC VARIABLE.**

**H<sub>2</sub>:** There will be significant association between pre-test level of the knowledge and selected demographic variable.

There will be a significant association between pre test levels of knowledge with demographic variables such as education and area of living

There is no significant association between pre test levels of knowledge with selected demographic variables such as age, sex, type of family, previous experience of respiratory problem, source of information and history of hospitalization

#### **IMPLICATION**

**NURSING PRACTICE:-**As a health care personal it is the responsibility of community nurse to enrich the knowledge of residents living her area to prevent the complications developed after the corona virus attack. Based on the information guide sheet the residents can act and protect themselves from pneumonia. Fostering knowledge of the population is considered as one of the major responsibility as it helps in the prevention of illness and promotion of health. Nurses are recognized as health care provider who gives 24 hours services to her patient population

**NURSING EDUCATION:-**Another area which can never be avoided by the field of nursing is the educator role. Nurses have so much of responsibility towards the patients who gets admitted to hospital. Nurse should have an idea of preparing different methods of teaching and learning materials to increase the awareness of the residents. She should able to motivate everyone against the development of the complications after the invasion of corona virus. One of the most essential qualities of a nurse is to provide education on various areas related to health which helps to prevent the adverse effects caused by an illness.

**NURSING ADMINISTRATION:-**All the nurses working in an area have many administrative roles and it is her responsibility to plan, organize, implement and evaluate various programs to enhance the awareness level of residents. As an administrator nurse can motivate her fellow members to conduct programs which helps to enlarge the awareness on the progress of a disease. If the disease is getting controlled at the early stage helps in

disability limitation. Appropriate program on correct time lent a helping hand is for every customer are recognized as a benchmark in disease prevention

**NURSING RESEARCH:-**Nurses are one of the health care personal who are considered to conduct more research on different areas of health activities. It is unavoidable to conduct research on complications of COVID 19. Pneumonia as the major adverse reaction it is recommended a nurse to conduct a educational research study which helps to reduce the death rate and disease rate among the affected population. Research can be conducted not only to the infected people but also among every individual to generate proper information and that helps them to handle the complications

#### **LIMITATIONS**

- Since the study was conducted among less number of sample generalization of the findings are limited to the population under study.
- Study limited to people who have internet
- Study is limited to the person who knows English

#### **RECOMMENDATIONS**

On the basis of the study it is recommended that

- Similar study can be conducted on a large group of sample in different area
- Similar study can be conducted in different settings
- Comparative study can be conducted between the knowledge between rural and urban area
- Same study can be conducted by using different teaching modalities

**CONCLUSION:-**The major objective of the present research study is to increase the knowledge among the residents about pneumonia in relation to COVID 19. Everyone acquired about corona pandemic through television, news paper and from different social media. Due to the severe impact the virus created in the physical mental, vocational and daily living condition it more important to foster the complication. Thus everyone can prevent complication thereby it helps to reduce the mortality rate and make them to be more cautious about it.

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## DEVELOPMENT & VALIDATION OF RP-HPLC TECHNIQUE FOR ESTIMATING RIVAROXABAN IN PHARMACEUTICAL DOSAGE FORMS

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**ABSTRACT:**-Rivaroxaban, anti-clotting drug, works at critical stage in clotting process to prevent blood clots from forming. In this work, RP-HPLC technique for determining rivaroxaban in tablets (Xarelto® (10 mg) was developed. At 40 degrees Celsius, Phenomenex Luna 5 m C18 100 LC Column (250 x 4.6 mm) was utilised. ACN: Water (55:45 v/v) was used to conduct isocratic elution. UV detection was at 249 nm & flow rate was 1.2 mL min<sup>-1</sup>. Within 2.21 & 3.37 minutes, internal standard (Caffeine) & rivaroxaban were eluted, respectively. Proposed technique was verified using ICH recommendations, & it was shown to be linear in range of 0.005 to 40.0 g mL<sup>-1</sup>. Technique was precise, accurate, sturdy, & quick. As result, it was successfully used for rivaroxaban quality control test in tablet dosage form.

**KEY WORDS** - RP-HPLC, Rivaroxaban, Development, Validation, Stability-indicating.

**INTRODUCTION-** Anticoagulants are used to keep blood from clotting or to keep existing clots from spreading. Clots can obstruct blood flow to heart muscle or brain. Heart attack or stroke can occur as result of several factors. Rivaroxaban (RIV), oral oxazolidinone-based anticoagulant, is strong, selective direct inhibitor of factor Xa that is used to prevent venous thromboembolism in adult patients who have had complete hip or knee replacement. RIV is tiny molecule (molecular mass: 436 g mol<sup>-1</sup>) with strong plasma protein binding (92–95%) in humans, with serum albumin being major binding component. great specificity of RIV binding to S1 & S4 sites of serine endopeptidase is responsible for potency of factor Xa inhibition. Factor Xa inhibition blocks both intrinsic & extrinsic pathways of blood coagulation cascade, preventing production of thrombin & creation of thrombi.[1] RIV has been shown to have no impact on platelets & does not block thrombin. In 2008, Health Canada & European Commission authorised RIV for marketing. There is HPLCMS technique for determining RIV in human plasma for pharmacokinetic research in literature. However, no method for quantifying RIV in pharmacological dose forms has been published. Quality control is well-known responsibility in pharmaceutical sector. Word quality control refers to collection of processes used to verify pharmaceutical's identification & purity. Stability testing of medication formulation, dissolution testing, & examination of raw materials & synthesis products are all examples of quality control measurements. [3] HPLC is unique technology for examination of broad range of samples, & it is used by pharmaceutical companies to test huge number of quality control samples. Goal of this work was to create HPLC technique for determining RIV in tablet dosage forms that was accurate, precise, robust, fast, & selective. RIV's stability was assessed, & forced degradation technique was used under stress conditions such as high temperature, acidic-alkali environments, & UV light irradiation. New technique was completely verified using ICH (ICH, 2005) criteria, & it was found to be capable of identifying RIV in presence of forced degradation products. As result, it is possible to conclude that this approach may be recommended for RIV quality control in pharmaceutical sector. [4]



## MATERIAL & METHODS

**Reagents & chemicals**-Refik Saydam Hfzshha National Public Health Agency provided RIV functional standard. Bayer Turkey provided medicinal formulations that were examined. Acetonitrile (ACN) was bought from Merck & was of analytical grade. [5]

**Chromatographic conditions & apparatus**-A Shimadzu UFLC system was used for HPLC analysis. Phenomenex Luna 5 m C18 100 LC Column was used for separations (250 x 4.6 mm). When employing isocratic elution with ACN: Water (55:45 v/v) combination, column temperature was adjusted to 40°C & flow rate was 1.2 mL min<sup>-1</sup>. Injection volume was 5 litres, & UV detection wavelength was 249 nm. peak's identification was established by comparing retention times. [6]

**Sample solution preparation**-To determine average weight, ten pills were weighed & grounded. Amount of powder corresponding to 10 mg RIV was put to 100 mL volumetric flask & sonicated for 30 minutes with 70 mL of diluent (ACN:Water (80:20 v/v)). To create solution containing 100 g mL<sup>-1</sup> RIV, volume was made up with solvent. After that, aliquot was taken & centrifuged for 10 minutes at 5000 rpm. Before injecting solution into HPLC system, it was filtered through 0.45 m membrane filter paper & diluted with mobile phase to 20 g mL<sup>-1</sup>. [7]

**Analytical placebo solution preparation**-Microcrystalline calcium phosphate (83 percent, 4150 mg), croscarmellose sodium (5 percent, 250 mg), colloidal silicon dioxide (percent 1, 50 mg), & magnesium stearate (percent 1, 50 mg) were weighed according to ratios in typical tablet formulation to obtain 5 g of bupropion. Then, using same technique used for production of tablet solutions, around 1 g of this mass was utilised to make analytical placebo solutions. By combining known quantities of RIV standard solutions to analytical placebo solutions, synthetic tablet solutions were created. [8]

**RESULTS & DISCUSSION**-The most typical technique for designing & verifying HPLC method is to adjust mobile phase composition after selecting acceptable column. RIV is non-hygroscopic powder that is very slightly soluble in organic solvents & insoluble in water & aqueous media. During production of standard stock solutions, we noticed that RIV was somewhat dissolved in methanol (MeOH). In earliest tests, solubility of RIV was simply examined in several organic solvents, with conclusion that RIV was obviously soluble in acetonitrile (ACN). As result, it was determined to separate RIV using combination of ACN & water in various proportions using C18 column. Caffeine was selected as internal standard (IS) for tests since it could be eluted with ACN: water combination without need of buffer & is common chemical in quality control laboratories. Under experimental conditions, well-defined caffeine peak was detected at 2.21 minutes. Despite fact that column temperature is essential parameter in HPLC separation of organic compounds, influence of solvent strength on solute retention is generally larger than effect of temperature. It was discovered that increasing column temperature from 30 to 40°C only affected retention time of RIV by around 5% & had no effect on retention time of IS. According to findings, RIV could be easily isolated & tested in less than 4 minutes under parameters listed. However, it was discovered that raising column's temperature resulted in superior peak forms. Because column's backpressure was manageable, flow rate was set at 1.2 mL min<sup>-1</sup> to increase efficiency while also reducing retention time. Finally, it was chosen to run analyses using ACN-Water ratio of 55:45 (v/v) at 40°C. RIV's UV spectrum in mobile phase clearly demonstrates that 249 nm is best wavelength to utilise for observing maximal absorption while avoiding interference from matrix components. Standard, tablet, analytical placebo solution, & RIV solution chromatograms deteriorated at high temperatures under ideal circumstances.

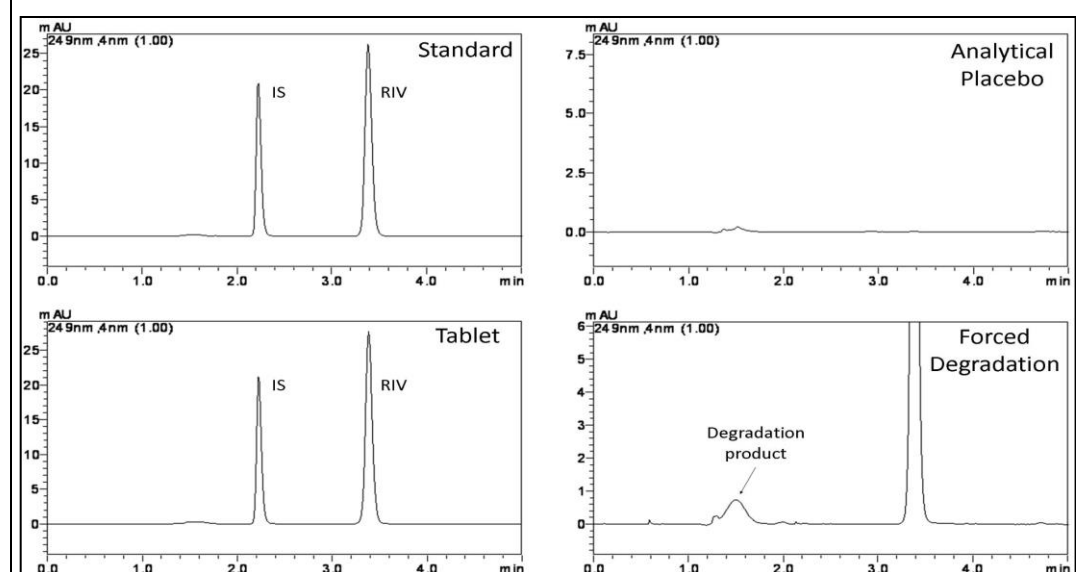
**Suitability of System**-The system suitability test was used to assess several characteristics such as column efficiency (plates), peak tailing, capacity factor, & resolution on

chromatograms recorded under ideal circumstances. Suggested technique obtained suitable resolution ( $>1.5$ ) & column efficiency ( $>2000$ ) while overall analysis time was less than 4 minutes. Table II shows system suitability findings. For IS & RIV, RSD of six consecutive injections was 0.25 percent & 0.28 percent, respectively. All of these findings support suggested HPLC technique for regular RIV analysis.

**TABLE 1: IS & RIV retention times for various mobile phase compositions & chromatographic column temperatures.**

Condition <sup>a</sup>	Mobile Phase Composition		Temperature	Flow Rate	Retention Time	
	ACN	H <sub>2</sub> O	°C	mL min <sup>-1</sup>	IS	RIV
1	60	40	40	1.20	2.167	2.976
2	55	45	40	1.20	2.216	3.371
3	50	50	40	1.20	2.268	3.965
4	60	40	35	1.20	2.166	3.004
5	55	45	35	1.20	2.214	3.430
6	50	50	35	1.20	2.270	4.061
7	60	40	30	1.20	2.168	3.061
8	55	45	30	1.20	2.208	3.491
9	50	50	30	1.20	2.271	4.147

<sup>a</sup>Condition 2 is selected to perform analysis



**FIGURE 1 - Representative chromatograms for RIV standard, RIV tablet, analytical placebo solutions, & RIV solution deteriorated at high temperature produced under optimal chromatographic conditions.**

**METHOD VALIDATION:-**According to ICH guideline, suggested technique was verified in terms of selectivity, linearity range, sensitivity, precision, accuracy, robustness, & ruggedness.

**Studies on forced deterioration & stability:-**For two separate reasons; stability of RIV in aqueous solutions was studied. First was to determine RIV's stability & demonstrate RIV's selective analysis under varied high stress situations. Second goal was to determine short- & long-term stability of standard solutions at ambient temperature & in refrigerator. Stress testing is required by ICH guideline on stability testing of drug substances & products to highlight intrinsic stability features of active substance & to allow quick identification of variations that may arise from changes in manufacturing procedures or source sample. Goal is to isolate & quantify standard drug & its breakdown products. Different stress conditions

were used, as specified in experimental section: high temperature, acid-base hydrolysis, & UV light irradiation. At 1.35 minutes, degradation products were visible under all of these circumstances. Technique was able to entirely separate degradation products from RIV that was still intact. With presence of degradation products, selectivity of proposed approach is validated. RIV stability was tested at room temperature for 24 hours, 4°C refrigeration temperature for 72 hours (short-term), & 1 month (long-term). RIV was stable at room temperature for 24 hours & at 4°C refrigerator temperature for at least one month, according to forced degradation & stability experiments, but not in acidic or alkaline environments, nor in high temperatures or under UV radiation.

**TABLE 2: Parameters of system appropriateness for suggested approach**

	RIV	IS
Retention Time (min)	3.37	2.21
Capacity Factor (k')	1.32	0.52
Efficiency (N)	7997	6369
Peak Symmetry	1.18	1.39
Resolution	8.9	

**Selectivity:**-The extent to which technique can detect certain analytes in complex mixture without interference from other components in mixture is referred to as selectivity. Method's selectivity was tested by making analytical placebo sample, reference solution, & commercial pharmaceutical formulation sample. Solution of analytical placebo (including all tablet excipients except RIV) was produced & injected into HPLC system according to sample preparation method. Because placebo chromatograms revealed no additional peaks, method's selectivity was validated. Peak purities verified that there are no matrix components interfering with peaks on standard solutions, tablet solutions, or forced degradation solution. Standard & tablet solutions had equal peak retention durations & peak areas, & technique was capable of distinguishing RIV & IS from forced degradation products. Standard, tablet, placebo, & forcedly deteriorated RIV solutions chromatograms.

**TABLE 3 - RIV recovery (percentage) following exposure to different temperature, pH, & UV light conditions**

Condition	Room Temperature	Refrigerator Temperature		Acidic Solution	Basic Solution	High temperature	UV light
	Temperature	25 °C	4 °C		40 °C	40 °C	80 °C
Time	24 h	72 h	1 month	2 h	2 h	2 h	24 h
Stability (%) <sup>b</sup>	100.5 □ 0.1	100.1 □ 0.2	99.0 □ 0.2	83.2 □ 0.1	83.0 □ 0.2	77.7 □ 0.2	35.1 □ 0.2

**Linearity:**-The capacity of analytical technique to produce test findings that are directly proportional to concentration (quantity) of analyte in sample (within defined range) is known as linearity. Concentrations versus peak area ratios were plotted to create calibration curve for RIV standards. Graph demonstrated that technique was linear up to concentration of 40 g mL<sup>-1</sup>. Eight separate standard solutions comprising 5.0, 10.0, 20.0, 25.0, 30.0, 35.0, & 40 g mL<sup>-1</sup> RIV & 40 g mL<sup>-1</sup> IS were produced & injected into HPLC system within linear range. Linear regression analysis was used to assess linearity, & regression equations, as well as standard deviations of slope (Sb) & intercept (Sa) of calibration curve, were computed using calibration graphs.

**Sensitivity:**-The signal-to-noise ratio is used to calculate sensitivity limit of detection (LOD) & quantification (LOQ). detection limit is lowest concentration level that produces peak height of three times baseline noise. quantitation limit is lowest concentration level that produced peak height with signal-to-noise ratio greater than 10 & precision (RSD percent) & accuracy (Bias percent) of less than 10%. HPLC method's LOD & LOQ values were determined to be 0.001 & 0.005 g mL<sup>-1</sup>, respectively.

**TABLE 4 - RIV analysis linearity using proposed technique**

Method	Range ( $\mu\text{g mL}^{-1}$ )	Calibration Curve <sup>a</sup>	Sa	Sb	R <sup>2</sup>	LOQ	LOD
HPLC	5.0-40.0	$y = 0.0952x - 0.0330$	0.0007	0.0183	0.9997	0.005	0.001

<sup>a</sup> Based on six calibration curves where y: peak area ratio & x: concentration of RIV as  $\mu\text{g mL}^{-1}$ ; Sa: Standard error of intercept; Sb: Standard error of slope; R<sup>2</sup>: Regression coefficient; LOQ: Limit of quantitation; LOD: Limit of detection

### Accuracy & Precision

Using six times examination of quality control samples, assay method's accuracy was determined for both intra-day & inter-day fluctuations. On six consecutive days (inter-day precision) & six times during same day, three different concentrations of standard RIV solutions (within linear range) were evaluated (intra-day precision). Results of intra- & inter-day evaluations for relative standard deviation (RSD) & bias revealed that method's precision & accuracy were adequate.

### Recovery

The recovery tests were carried out using usual addition procedure to see if excipients in pharmaceutical formulations interfered with analysis. Three concentration levels were chosen, & RIV standard solutions in known quantities were added to tablet solutions. ultimate concentrations were linearly related. These solutions were made three times & examined using approach that was established. Intercepts of calibration curve (0.0952 0.007 (mean SE)) & standard adds approach (0.0936 0.0201 (mean SE)) were identical, indicating that there was no influence from matrix components. Another angle on recovery research was to use presented approach to assess synthetic tablet solutions. Synthetic tablet solutions were produced six times & evaluated using proposed technique, with synthetic tablet solutions recovering 97.89 0.68 percent of conventional RIV.

### Robustness

The robustness of analytical technique is measure of its ability to stay unaffected by minor but purposeful changes in method parameters, & it indicates its dependability in regular use. Variations in column temperature (five degrees Celsius) & ratio of organic material in mobile phase (five percent of ACN volume) had no influence on reaction. Within these modest variations in mobile phase component & column temperature, peak area ratios varied between 99.8% & 102.4 percent. Results were statistically analysed, & there were no significant differences ( $p > 0.05$ ) among them.

### Reproducibility

The robustness of created approach was demonstrated by using identical methods by two separate operators. Lack of substantial difference in analysis findings indicates that proposed approach is reliable.

**TABLE 5 - developed method's precision & accuracy**

	Add ed ( $\mu\text{g mL}^{-1}$ )	Intra-day			Inter-day		
		Found <sup>d</sup> ( $\mu\text{g mL}^{-1}$ )	Precision <sup>b</sup> RSD %	Accuracy <sup>c</sup> Bias %	Found ( $\mu\text{g mL}^{-1}$ )	Precision RSD %	Accuracy Bias %
RIV	10	10.26 $\pm$ 0.13	2.15	2.56	9.80 $\pm$ 0.08	1.33	-1.98
	20	20.15 $\pm$ 0.16	1.34	0.74	20.23 $\pm$ 0.35	3.01	1.16
	35	35.15 $\pm$ 0.30	1.49	0.41	35.06 $\pm$ 0.11	0.52	0.16

### Use of newly discovered technique

RIV was determined using approved technique in commercially available Xarelto® (10 mg) tablets. This is example of typical HPLC chromatogram of RIV tablet solution with retention

period of 3.37 minutes & no excipient interference. Test (n=6) produced result of 100.94 percent (RSD = 1.17 & SE = 0.53) of labelled claim. These findings suggest that technique is selective for RIV analysis, with no excipient influence. low RSD value along with appropriate accuracy suggests that this approach is suitable for regular RIV analysis.

**TABLE 6 - RESULTS OF TABLET ANALYSIS**

Tablet Solutions	Xarelto <sup>®</sup> Tablets (10 mg RIV)	
	RIV (mg)	Recovery (%)
1	10.17	101.68
2	9.91	99.14
3	10.00	100.01
4	10.17	101.66
5	10.23	102.26
6	10.09	100.90
Mean ± SE	10.09 ± 0.05	100.94 ± 0.48
RSD <sup>a</sup>	1.17	
Bias <sup>b</sup>	0.94	

**CONCLUSION:-**The goal of this work was to create simple, accurate, selective, & sensitive RP-HPLC RIV technique for pharmaceutical analysis. This is sole method for determining RIV in pharmaceutical dose forms that has been published too far. In compliance with ICH requirements, technique was verified for selectivity, accuracy, linearity, precision (inter-day & intra-day), sensitivity, robustness, & ruggedness. Findings of stress testing, which included separation of degradation product & quantification of RIV following stress exposure, reveal that technique is stable & capable of detecting RIV in presence of its degradation products, showing method's selectivity. simple mobile phase that does not need preparation of any buffer solution or addition of ion-pairing agents, as well as quick run time, make this technique ideal for regular analysis of large numbers of samples each day. [9]

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## Generic steps to implement an NLP project from any field

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**Abstract** - Data science exposes pattern and provides insights that companies may utilise for better choices and new goods and services. Often most significantly, it allows machine learning models to learn from the enormous quantity of data supplied to them instead of depending mostly on company analysts to see what they can find from such data. In order to extract value from data, data science integrates many areas, including statistics, research techniques, artificial intelligence (AI) and data analysis. Data science includes the preparation of data for analysis, including data pre-processing, compilation and transformation for advanced data analysis. Natural Language Processing (NLP) is a subset of Data Science concerned with extracting information from "text." NLP thus plays a significant part in data science. In this article, we will examine the essential steps to realise any NLP project from various fields.

**Keywords:** Data Science project, NLP, Artificial Intelligence, machine learning, Data Science project

### 1. Introduction

Natural language processing (NLP) is an interesting area of artificial intelligence (AI) that enables computers to decipher and comprehend human language. NLP is a discipline of artificial intelligence that is rapidly gaining popularity. We often use natural language processing methods to analyse text data for analytical purposes. We get NLP when we adopt AI and emphasize on human languages. NLP enables people to speak to machines. Computers can comprehend, interpret, and modify human language in this AI area. NLP is a subset of Artificial intelligence, like machine learning or deep learning. We discuss text pre-processing methods, machine learning techniques, and Python modules for natural language processing in this article. Tokenization, text normalisation, and data cleansing are some of the text pre-processing methods available. Once the data has been transformed into a common format, a variety of machine learning methods may be used to better comprehend it. Popular modelling methods are used to identify emails as spam or not, and to evaluate the sentiment of tweets on social media sites such as Twitter. Modern, very sophisticated methods, such as topic modelling, word embeddings, and text generation using deep learning, may also be used to generate text.

All of the stages of a text analysis project include the use of various natural language processing libraries in Python, such as NLTK, TextBlob, spaCy, and gensim, in addition to the standard machine learning libraries, such as pandas and scikit-learn. Everything begins with a data cleansing process.

### 2. Data cleaning

Data cleaning is a time-consuming and unenjoyable activity, but it is one that must be completed since it is critical. Remember, "dust in, trash out." Feeding filthy data into a model gives us nonsensical results. The python library that is often used in this step is the re(regular expression).

In particular, we are going to go through:

Obtaining the data - We'll scrap data from a website in this instance

Data cleaning - We go over common text pre-processing methods

Organization of data - we arrange cleansed data in such a manner that other algorithms are simple to enter.

After applying this technique our data will be clean, structured data in two common text formats:

- **Corpus** - It is a collection of machine-readable texts that have been generated in a natural communicative environment that is known as a corpus. These texts have been sampled in order to be representative and balanced in terms of certain characteristics, such as type (newspaper articles, literary fiction, spoken speech, blogs and diaries, and legal records).
- **Document Term Matrix** - It is also known as a term-document matrix or a document-term matrix, and it is a mathematical matrix that represents the frequency with which certain words appear in a collection of documents. Document-term matrixes are arranged such that rows correspond to documents in a collection and columns relate to terms in the collection.

The removal of null values and duplicate data, the treatment of outliers, and other data cleaning procedures are often required when working with numerical data. Text data may be cleaned up using a variety of methods known as text pre-processing techniques, which are also often used with text data. This cleaning procedure may take an indefinite amount of time with text data. Every cleaning step has an exception, and this is no exception. Consequently, we will use the MVP (minimum viable product) strategy, which is to begin with a basic design and iterate. The following are some things you can do to tidy up your data. We're just going to perform the most basic cleaning procedures right now, and the remaining can be done in the future to enhance our outcomes even more.

Data cleansing procedures that are common throughout all text include:

- Make all of the text in lower case.
- Remove all commas and semicolons.
- Remove any numerical values from your document.
- Remove frequent nonsensical text (/n) from your document.
- Text should be tokenized to eliminate stop words.

Following tokenization, there are further data cleaning steps, few of them are:

The process of stemming and lemmatization

- Create bi-grams or tri-grams
- parts of speech tagging.
- Deal with mistakes on a regular basis

### **3. Exploratory Data Analysis**

Exploratory Data Analysis is a kind of data analysis that is exploratory in nature. Following the data cleansing phase, in which we organise our information into a few common forms, the following step is to examine the information and determine whether or not what we're seeing

makes sense. First and first, it is critical to thoroughly investigate the data before using any sophisticated algorithms.

We may utilise a number of different exploratory data analysis (EDA) methods when dealing with numerical data, including determining the average of the data set, the distribution of the data, and the most frequent values, among so many other topics. When dealing with text data, the concept is the same as when working with images. After finding some more apparent patterns using EDA, we will use machine learning (ML) methods to uncover even more hidden patterns. The python library that can be used in its implementation are wordcloud, sklearn and many more.

#### **4. Sentiment analysis**

So far, everything of the analysis we've done has been quite standard - counting data, plotting scatter plots, and so on. Additionally, these methods may be extended to quantitative information. With text data, there are a few common methods that we'll go over in detail, beginning with sentiment analysis, which is the first of these techniques. There are a few important things to keep in mind while doing sentiment analysis. The TextBlob library is used for this purpose in python.

**TextBlob Module:** Based on their subject knowledge, linguistic experts have classified the sentiment of words in the TextBlob module. Words' emotional connotations may change depending on where they appear in a phrase. TextBlob is a module that enables us to take use of these labelling opportunities.

**Sentiment Labels:** Each word in a corpus is labelled in terms of polarity and subjectivity, and this is done for each individual word. The sentiment of a corpus is the average of all of them.

The polarity of a term refers to how positive or negative it is. -1 is an extremely negative number. A score of +1 indicates a highly good outcome.

Subjectivity is defined as the degree to which a term is subjective or opinionated. The number zero is a certainty. +1 is very much a matter of personal opinion.

#### **5. Topic Modeling**

Topic modeling is another popular text analysis technique that is used today. What Topic Modeling is, as the name implies, is a technique that automatically identifies themes existing in a text object and derives hidden patterns shown by a large amount of text data. Multiple applications of topic models are possible. Some of these include:

- The aggregation of documents
- It is possible to organise huge blocks of textual information.
- Retrieval of information from unstructured text is referred to as information extraction.
- Selecting out certain features

Ultimately, the goal of topic modelling is to identify different topics that are existent in your corpora. At the very least, each document in the corpus will be comprised of one, if not many, themes. In this paper, we will look at the steps involved in performing Latent Dirichlet Allocation (LDA), that's one of many topic modelling techniques available today. It was created specifically for the transmission of text data. The gensim and scipy libraries of python are capable of performing Topic Modeling. If we want to use a topic modelling technique, we'll need to provide:



- a Document-Term Matrix and
- the number of topics to be extracted.

Once the topic modelling technique has been applied, it is our responsibility as a human to interpret the results and determine whether or not the string of words in each topic makes good sense. If they still don't make any sense, we can experiment with different numbers of topics, different terms in the document-term matrix, different model parameters, or even a different version altogether. One common technique is to restrict your search to words that come from a certain portion of speech like only nouns, only adjectives or a combination of both etc.

## 6. Text Generation

Text Generation is a term that refers to the process of creating text. Markov chains may be used to generate extremely simple text in a variety of situations. Consider each word in a corpus as a state of affairs. We can make the simple assumption that the next word is solely reliant on the preceding word - which is the fundamental assumption of a Markov chain - and we're good to go. Although Markov chains do not produce text as good as deep learning, they are an excellent starting point. Markov chains are stochastic processes with a limited number of states that transition from one state to another based on a random determination. These sequences of transitions from one state to another are defined by a probability distribution of the transitions. The most essential thing to remember about this situation is that the next state is completely reliant on the preceding one. The probability distribution is used to select the next state. As a result, Markov chains are referred to as "memoryless." Because they have no memory, these chains are unable to produce sequences that include any kind of underlying pattern or trend. They simply lack the capacity to create information that is dependent on the context since they are unable to take into consideration the whole chain of previous states. The Markov Chain Function is implemented with the help of the function from the Collections library by importing defaultdict in python.

### 6.1 Creating a Markov Chain Function for Text Generation

We will construct a basic Markov chain function that will generate a dictionary by following these steps:

- It is recommended that the keys include all of the terms in the corpus.
- The values should consist of a list of the words that appear after the keys.

#### Creating a Text Generator for our needs.

To produce sentences, we'll write a function that will be called by the programme. It will need the following two inputs:

- A dictionary that was just created.
- The number of words we want to produce.

**6.2 Text Generation with LSTM Recurrent Neural Networks:** -For generating automated text recurrent neural networks can be used as a generative algorithm. LSTM recurrent neural network is basically used to develop predictive model and now the same can be applied for generating the text by using the sequence of the problem it has learnt. They may also be used to learn the sequences of a problem and then create completely new logical sequencing for the problem domain, in addition to being utilised for predictive models to make predictions.

Generic models like as this one is helpful not just for evaluating how effectively a model has learnt an issue, but also for gaining a better understanding of the specific problem itself.

LSTM recurrent neural networks may be used to build a generative model for text that is character-by-character accurate. The Keras package makes it possible to do this in Python.

## **7. Conclusion:**

It is quite obvious from the article that for creating an end to endnlp project which really is a branch of data science we need follow certain sequential procedures as mentioned in this article. It should start with the Cleaning of data, which can then be utilised for the exploratory data analysis followed by the other NLP methods like sentiment analysis, visualizations, topic modelling and text creation. Thus, these methods described in this paper provides a foundation for any NLP project like email spam detection, generating insights from the text data from any domain as a part of market research, sentiment analysis of customer reviews, developing chatbots and so on.

## **8. Future Scope:**

Although this article does not explain how all of the stages stated in an NLP project are really implemented in actual programming, it does provide a foundation for the future scope of the actual implementation in Python, which will involve coding as part of it. It is possible to design a full set of stages in NLP, as well as their execution.

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## Study of the Convergence of Text Mining with NLP Techniques

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**Abstract:**-Today massive amount of text data generated digitally through various sources like websites, newspapers, blogs, vlogs, audio, video, social media because of the increasing use of Internet by all users in their day-to-day life. Also, reviews, emails from customers doing online shopping, businesses etc. add to the speedy growth of this digital data. Mostly all this data is in natural language. Natural languages are those languages used by humans for communication all over the world. The plethora of this textual data can be analyzed using text mining tools and techniques to extract inherent, relevant information out of it. This information can be effectively used by the respective organizations in business trend analysis, customer relationship management or business level decision making processes. These strategies, when combined with NLP techniques improves the overall performance of the process while also simplifying its implementation. This study points out brief overview of blend of two highly trending technologies that is text mining and NLP.

**Keywords:** Text Mining, Natural Language Processing, Text Pre-processing

**1. Introduction:**-Text Mining is a multi-disciplinary field based on information retrieval, data mining, machine learning, statistics and computational linguistics (Talib et al., 2016). Text mining is a subset of data mining techniques. Both of these technologies are used to analyze large amount of data to produce meaningful insights by discovering knowledge from inputs applying some set of algorithms, tools and techniques. Main difference between these two is the type of data handled by them. Data mining deals with structured data, whereas text mining techniques are used for unstructured and semi-structured text data.

Structured data can be a collection of numbers, dates or facts populated in any database system maintained in a well-organized format, hence it is homogeneous. Unstructured data on the other hand is generated substantially in textual format. Unstructured data that is predominantly collected from various sources such as reports from various organizations (like finance, medical etc.) and any digitized sources mainly from internet, social media feeds, websites, blogs, vlogs, customer reviews, newspapers etc.

Unstructured data as gathered so is in unorganized, raw form thus heterogeneous and by default generated in languages used by humans all over the globe for communication known as natural languages. Processing massive amount of unstructured data is certainly out of the scope of human processing because of its size, speed of generation and need of urgency in the outcome. The process thus can be automated to be processed by machine applying text mining techniques. But here the main challenge is the unorganized data that too in natural languages which cannot be feed to machine directly as machines are unable to process input in human readable form. Here the convergence of text mining arises with the Natural Language Processing techniques (NLP).

Natural Language Processing techniques based on Artificial Intelligence comes under the Machine learning discipline. NLP is also known as computational linguistics. NLP includes many techniques like part of speech (POS) tagging, semantic dependency graph

representation of text, named entity recognition, word sense disambiguation, parsing etc. (Gupta et al., 2019) applicable in text mining. It is a computerized approach to analyze, understand and find the meaning of text free of natural language (Gupta et al., 2019).

## 2. Review of Literature

In (Rehman et al., 2018) authors performed a detailed study of various statistics-based topic modeling techniques. In this paper a comparative study is carried out for Urdu Language corpus. Here a model named Variational Bayes Urdu Latent Dirichlet Allocation (VB-ULDA) is proposed for Urdu Language. In comparison with the other existing topic modeling techniques, authors concluded that the proposed VB-ULDA technique successfully detects and create topics for Urdu language.

This (Gupta et al., 2019) study delves into the use of natural language processing in software repositories. Author concluded that for improving the quality of software and software processes, complex software repositories can be mined in search of valuable information which will be helpful to support numerous software engineering tasks.

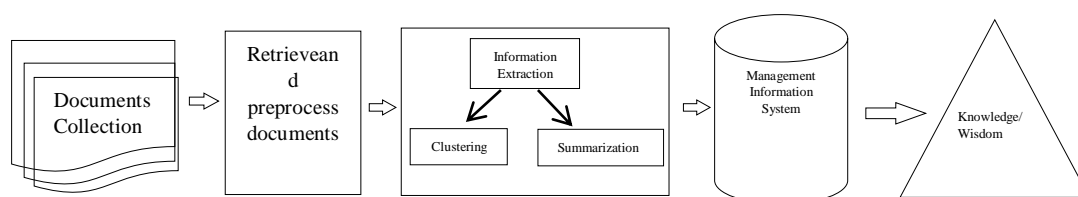
In (Agarwal et al., 2016) this research author applies natural language techniques and patient's readmission prediction is carried out by their readmission analysis. Authors discovered that 15% of the full feature set selected using Naïve Bayes classifier with Chi-squared test to be most effective. Author's current structured system uses bag-of-words representation with UMLS annotations for predicting patient's readmission. According to the study in many cases current structured system predicts better than existing system.

In (Talib et al., 2016) this research work authors discussed about Text mining techniques, its applications and issues. The figure describing the interaction of text mining with the other field is intuitive and gives thorough idea about the overlapping of key disciplines. After that the generic text mining process is been described by author with the help of a suitable diagram. Then discussion about core functionalities of different text mining techniques with their interrelationship is been explained. In the next section various text mining applications were been put forward. Next to those issues of text mining were discussed by authors. Lastly author concluded discussion about major issues and challenges along with future research areas about text mining.

This (Likhita et al., 2019) paper examined that text mining is one of the most significant field in the digital era because of the rapid growth of the textual information. Topic models are gaining popularity in last few years.

## 3. Text Mining Process

Following diagram shows the generic process of Text Mining (Talib et al., 2016).



**Fig 1. Generic Process of Text Mining (Talib et al., 2016)**

To carry out text mining process for text analytics or knowledge discovery this generic process is followed.

During first phase documents needed to be analyzed are collected and converted into corpus. In text mining, corpus is a term used for the set of data to be analyzed.

Second phase can be considered as the heart of analytics process as the efficiency of outcome almost is decided by this phase. It can be iterative process depending on the quality of data to be processed. This phase consists of key processes such as Tokenization, Stemming, Lemmatization, Stop word removal. The goal of this phase is to prepare the corpus in machine understandable format. Before tokenization, data cleansing and normalization is carried out on corpus where spelling mistakes, typo, punctuations, special characters, and numbers has to be removed and then the whole set of text is converted into lowercase.

- **Tokenization** is the first process of NLP which carries out fragmentation of documents in processable chunks e.g., document is converted as set of paragraphs, a paragraph further tokenized as a set of sentences and sentences as a set of words. Thus, now the whole data is a large set of meaningful tokens. According to the natural language of documents language specific tokenizer needed to be used.
- **Stemming** is done on the corpus to get rid of repetitive tokens. This issue arises due to the use of certain words getting repeated with a prefix or suffix. Stemming is to reach to the stem or base word by chopping the suffix. E.g. swim, swimming, swimmer these words were made up of a single stem word swim. Aim of stemming is to prepare a set of unique tokens to achieve final analysis to be effective, efficient. Stemming uses language-specific rules.
- **Lemmatization** is much similar to the stemming process in the sense that it will try to collect lemma that is base word from the similar occurrences of words but lemmatization takes into consideration the context or inherent meaning of the word while arriving to the lemma rather than just chopping off the suffix. Lemmatization uses Part of Speech (POS) tagging technique which is also NLP based. While categorizing the words their language-specific role is taken into consideration. For e.g., noun, verb or adjective etc. Thus, Lemmatization is NLP tool so capable to produce better results than stemming.
- **Stop words removing** is carried out with the aim to make the corpus clearer and cleansed set of tokens sieving general words of natural languages which hardly takes part in the meaning of sentence. In English language words like the, is, are, which, were, was, am can be considered as stop words and those were removed from the corpus. Depending upon the domain of work customized stop word list can be provided to be removed from the corpus.

Third phase is Information Extraction (IE) which takes the preprocessed and so cleansed textual data or corpus as an input. Named-Entity-Recognition (NER) technique of NLP can be used here. Information Extraction could be aimed at

- **Clustering** is an unsupervised process to classify the text documents in groups by applying different clustering algorithms (Talib et al., 2016). The main difference in clustering and classification is that, while grouping clustering do not use pre-existing labeled groups just like classification do. There are two approaches for clustering. Agglomerative which is Bottom up and Decisive which is top down. Based on the similarities between the words clustering is carried out.
- **Text Summarization** As the name suggest, it is a process of converting the large input text into brief summary. Text mining with NLP techniques is used to automate the

process of summarization. There are two types of text summarization as Extractive summarization gives summary text which is same as from input document while abstractive summary uses parsing and semantics of text, where NLP comes in, to calculate summary of the input document. Summary can be performed on single or multiple documents.

Forth phase pattern analysis is implemented by Management Information System (MIS)(Talib et al., 2016).

Thus, hidden but probably useful information or knowledge can thus be obtained for further use. For effective and timely decision making and trend analysis (Talib et al., 2016) the outcome of process can be applied.

NLP also contribute to the other areas of Text Mining such as:

- **Information Retrieval (IR)** is a process of extracting relevant and associated patterns according to given set of words or phrases (Talib et al., 2016). NLP is used in IR (Meparlad, 2020). IR is a software program that deals with large storage, evaluation of Information from large text documents from repositories (Meparlad, 2020). E.g., application of IR in web search, auto complete, spell checking etc.
- **Topic Modeling (TM)** is mostly used in text mining to find hidden linguistic structure in a text of particular document (Rehman et al., 2018). TM is unsupervised method used for identifying topics or keywords from the corpus for classification. Before applying TM techniques dimensionality reduction needed to be achieved which can be done by NLP techniques. Though simplistic, bag-of-words often produces good results with minimal feature engineering and can be combined with other techniques such as tf-idf to give unequal weighting based on document frequency (Agarwal et al., 2016).

**Conclusion:-**The study presents brief overview of merging of two highly trending technologies that are text mining and natural language processing. Text mining deals with textual data and NLP deals with natural languages data for processing. Use of classical statistical methods for data mining is complemented by NLP techniques which enhances the efficacy of text mining. The limitations of this study are, it doesn't give in depth knowledge of NLP techniques but just points out where exactly the two disciplines integrate. If future study or practical applications of these techniques needed to be done detailed knowledge of both methodologies will be required before proceeding. There will be considerably more possibility for multiple technological breakthroughs in NLP in near future, which will undoubtedly leverage the way text mining is done today.

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## Manual Dexterity, Aging and its Clinical Implications

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**Abstract:**-Manual dexterity is a complex skill that involves the capacity to regulate finger movements accurately and quickly in a coordinated and adaptive manner, such as fine control in gripping and manipulating small items. According to studies, there is a multi-component loss in manual dexterity in older adults, particularly in the elderly (Carment, 2016). Fine motor skills aid a person with a variety of daily activities such as buttoning, tying shoelaces, combing, zipping, and writing. Impairment of fine motor control could impose significant restrictions with the increased use of technology gadgets such as mobile phones, remote controllers for electrical appliances, computers, or laptops. Impairment of fine motor control could impose considerable restriction in participation. Because most ADL require the hands, and some lower extremity tasks substitute for upper extremity tasks when assistive equipment such as crutches and wheelchairs are used, manual dexterity is critical for sustaining performance in ADL. Manual dexterity deteriorates with age, which can have a severe influence on daily tasks and independence (Ranganathan et al., 2001). The goal of the study is to look at the direct and positive link between manual dexterity and ageing. This is a review of many researchers' research findings. Manual dexterity and fine motor skills are utilised interchangeably in this study.

**Key words:** Dexterity, Precision HandGrip, Aging, Cognition, Fine motor skills

**Introduction:**-Dexterity, also known as fine motor skill, is the synchronisation of small muscles in motions that mainly include the hands and fingers synchronising with the eyes. Humans have complex levels of manual dexterity, which can be attributed to and proven in nervous system-controlled tasks. Fine motor abilities aid in the development of intellect and continue to develop throughout a person's life.

A high level of manual dexterity is characteristic of the human upper limb. Each developmental stage of a child's life, as well as throughout our lifetimes, sees a gradual increase in motor abilities. They are first recognised during a child's developmental stages: infancy, toddlerhood, preschool, and school age. Fine motor skills in children grow gradually and are typically mastered between the ages of 6 and 12. These skills will develop with age, experience, and increased muscle activity while performing sports, playing an instrument, utilising the internet, and writing.

Manual dexterity is a complex task that entails the ability to manage finger movements accurately and swiftly in a coordinated and adaptive manner, such as holding and handling small objects. Humans have highly specialised manual dexterity allowing them to control a wide range of goals and objects. (Krampe et al, 2002). In investigations, there have been findings of age-related impairments in maximal grip force, sensory functioning, and object grasping and manipulation (Vieluf et al., 2013; Goble et al., 2009).

**Manual Dexterity and Aging:**-When it comes to specific manual dexterity components, accuracy in force control tasks declines with age, and finger movement independence may worsen (Lindberg et al., 2010; Santisteban et al., 2016, Mirakhorlo et al., 2016). Finger movement variability has also been observed, as well as motor slowdown. These findings point to a multi-faceted loss in manual dexterity in older persons, particularly the elderly. The



importance of hand function in everyday life is that it allows people to be more independent. Most simple as well as complex daily duties, including as feeding, grooming, handling money, and taking medicines, become difficult without normal hand function and frequently lead to the dependant on care giver.

Measures of manual dexterity can be helpful in detecting age-related functional loss and predicting cognitive decline. Manual dexterity markers should be able to distinguish between deficiencies caused by cognitive decline and those caused by normal ageing (Loic Carment and colleagues, 2018). Hand functioning and manual dexterity, which need a fine precision grip, are common problems in the elderly, as is a loss of hand strength, which can impede routine daily tasks. Functional capacity appears to be stable until the age of 65, after which it begins to diminish gradually.

To manage small items with dexterity and competence, precise finger force control is essential. Numerous investigations have demonstrated that with age, this fine control of finger forces deteriorates, especially after the fifth decade (Diermayr et al., 2011; Bohannon et al., 2006; Ranganathan et al., 2001). In ordinary life, impaired force control interferes with older people's independence by affecting self-care activities such as buttoning a shirt, using a key, or cutting with a knife. The ability to manage precise finger force has been proven to deteriorate with ageing. The changes in the processing of fine motor control tasks with increasing age are caused by difficulties of late middle-aged adults to produce a predefined amount of force in a short time (Solveig et al., 2013).

Hand function deteriorates in men and women with age, especially after the age of 65. Hand-grip strength declines rapidly beyond 60 years of age, by as much as 20–25 percent, accompanied by a significant loss of muscle fibres and decreased muscle-fiber length, especially in the Thenar muscle group. Reduced microcirculation of the synovial sheaths of the tendons and tendons unit as a result of age causes difficulty in adapting to external stress, decreased range of motion, and decreased flexion. This could result in flexion contractures of the overlying joints, which would impair hand use. Elderly people' muscles have fewer (but larger and slower) motor units, which has a significant impact on motor control and function. The loss of motor neurons has been linked to a significant deterioration in age-related motor ability.

Age-related impairments in maximal grip force sensory functioning, as well as gripping and manipulating objects, have been observed in studies (Vieluf et al., 2013; Goble et al., 2009). When it comes to specific manual dexterity components, accuracy in force control tasks declines with age and finger movement independence or finger individuation may worsen. (Lindberg et al., 2010; Santisteban et al., 2016 ). Aging has also been linked to increased finger movement variability and motor slowdown.

There is evidence that age-related alterations occur in neurophysiology as well as neurotransmitter responses. The cognitive and psychomotor abilities of an individual reflect the integrity of the CNS. The CNS regulation processes of negative and positive feedback mechanisms are required for a successful prehension task. A circuit of interconnected hand-related areas, comprising a ventral subdivision of the premotor and sensorimotor cortical areas, the cerebellum, and the basal ganglia, is required for manual dexterity. This may be altered by physiologic changes, influencing comprehension tasks (Carmeli and colleagues, 2020). Tensile strength is a measurement of how long tendons can stretch. The tensile strength of tendons is a measure of elongation of the tendon during tensile testing, the ultimate tensile strength values for aged tendons decrease by 30–50%, which will contribute to the Hand Dexterity.

Hand function in the older population deteriorates as a result of age-related degenerative changes in the musculoskeletal, circulatory, and neurological systems. Hand function declines in aged people due to a mix of local anatomical changes (joints, muscle, tendon, bone nerve and receptors, blood supply, skin, and fingernails) and more distant neural control alterations. These age-related alterations are frequently accompanied with underlying pathological disorders like osteoporosis, osteoarthritis, rheumatoid arthritis, and Parkinson's disease (Carmeli and colleagues, 2020).

Extrinsic Factors includes Environmental factors (ultraviolet radiation, chemical irritants), physical activities (work-related, recreational sports, and hobbies), nutrition, Traumatic injuries, where as Genetic endocrine disorders, metabolic disorders, and certain diseases like osteoarthritis, , rheumatoid arthritis, osteoporosis constitutes the intrinsic factors.

### **Manual dexterity and cognition**

Hand function and cognition deteriorate as people age. Most healthy elderly undergo sensorimotor alterations and cognitive losses of various kinds at the age of 65, which can make daily activities difficult. Few researches have looked into the probable interaction between cognitive function and dexterity to our knowledge. The senior subjects completed the dexterity tests at a slower pace and with less diversity in their motions than the younger ones. According to some study, elders perform slower on the identical dexterity task than younger persons with distinct movement patterns, and age-related deficits in cognitive areas can lead to dementia.

It is critical to consider the deleterious consequences of frailty on cognitive functioning. The link between motor alterations and cognition is one facet of this subject that is particularly relevant to cognitive ageing. We know that sensorimotor alterations that occur with normal ageing are intimately linked to the cognitive level of the elder. It is clear that as people get older, their cognitive functions get increasingly involved in sensorimotor processes, and their behaviour slows down. (Scherder et al., 2008; Li & Dinse et al., 2002). As a result, a number of studies have looked into the link between certain cognitive changes and sensorimotor deficits. All of these motor changes, including dexterity, can be investigated in relation to one another.

According to Loic Carment et al., 2018, there is a difference in hand dexterity tests between those with cognitive impairment and people who are older and healthy. Manual dexterity tasks that need performance updates based on (temporal or spatial) task rules stored in short-term memory are significantly affected by cognitive decline. Tasks requiring online matching of motor output to sensory signals, on the other hand, were affected by age rather than cognitive level. Dexterity functions in the hands are impacted by several neurological diseases. On a manual dexterity test, those with Parkinson's disease performed worse than a control group that was matched for age and gender. People with PD may find it difficult to perform fine manipulative hand activities like writing, tying shoelaces, and buttoning clothes, and some leisure activities that require dexterity may become impossible (Manson et al., 1985). Although the exact mechanisms for the loss of dexterity are unknown, people with PD have manual deficits, including reduced finger torque and decreased interdigit individuation compared with age-matched unimpaired people (Vaillancourt et al., 2002). Stroke often leads to impaired hand function and decreased manual dexterity, limiting activities of daily living and impacting quality of life. Dexterity tests measure the accuracy of hand and finger movements under controlled conditions. There are several ways to assess dexterity. Occupational Skills Assessment Test Battery, Purdue Pegboard Test, Pegboard Scoring, Grooved Pegboard, Hand Tool Dexterity Test, Minnesota Manual Dexterity Test, Complete Minnesota Manual Dexterity Test, Work Ability Rate of Manipulation Test, Roeder

Dexterity Manipulation Test, Jebsen-Taylor Hand Function Test, NineHolePegtest are some them.

**Conclusion:-**There is a strong correlation existing between Dexterity and Aging. As age advances there are various alterations in motor control, sensorimotor, and cognitive functions which in turn affect the dexterity functions. As researches reported there is difference in dexterity dysfunctions among healthy elderly and subjects with mild cognitive impairment. So it is important to make awareness about the maintenance of hand functions as age advances.

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## A descriptive study among women regarding management of diarrhoea in children

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**Abstract-**The current study has been under taken to assess the Knowledge score regarding management of diarrhoea in children among Women in selected living area, Bundi. The research design used for study was descriptive in nature. The tool for study was self-structured knowledge questionnaire which consists of 2 parts-PART- I consisted questions related to Socio-demographic data; PART-II consisted of self -structured knowledge questionnaire to assess the knowledge score regarding management of diarrhoea in children among Women. The data was analyzed by using descriptive & inferential statistical methods. The most significant finding was that 43.5% subjects have poor knowledge, 39.1% have average knowledge score while 17.4% women were having good knowledge score.

**Key-word-** Management of diarrhoea and Women.

**1. Introduction:-**Diarrhoea is the passage of loose or watery stools occurring three or more times in a 24-hour period which means an increased frequency or decreased consistency of bowel movements, and it affects people of all ages. It is usually a symptom of an infection in the intestinal tract, which can be caused by a variety of bacterial, viral, and parasitic organisms. Diarrhoea is the second leading cause of child morbidity and mortality, especially in the developing countries. Globally, it is estimated that there are 2.5 billion episodes and 1.5 million deaths annually in children fewer than five years. Diarrheal diseases are major causes of malnutrition, delayed physical development, and early childhood mortality in developing countries and poor communities, and the major cause of death in children with diarrhea is loss of water and essential minerals.

### 2. Objective of the study

1. To assess the knowledge scores regarding management of diarrhoea in children among Women.
2. To find out association between knowledge score regarding management of diarrhoea in children among Women with their selected demographic variables.

### 3. Hypotheses:

**H<sub>0</sub>:** There will be no significant association between knowledge score on management of diarrhoea in children among Women with their selected demographic variables.

**H<sub>1</sub>:** There will be significant association between knowledge score on management of diarrhoea in children among Women with their selected demographic variables.

**4. Methodology:-**A descriptive research design was used to assess the knowledge score regarding management of diarrhoea in children among Women residing in selected Living area, Bundi. The study was carried out on 46 Women selected by convenience sampling technique. Demographical variable and self-structured 30 knowledge questionnaire were used to assess the Knowledge score regarding management of diarrhoea in children in children by survey method.

## Analysis and interpretation

### SECTION-I Table -1 Frequency & percentage distribution of samples according to their demographic variables.

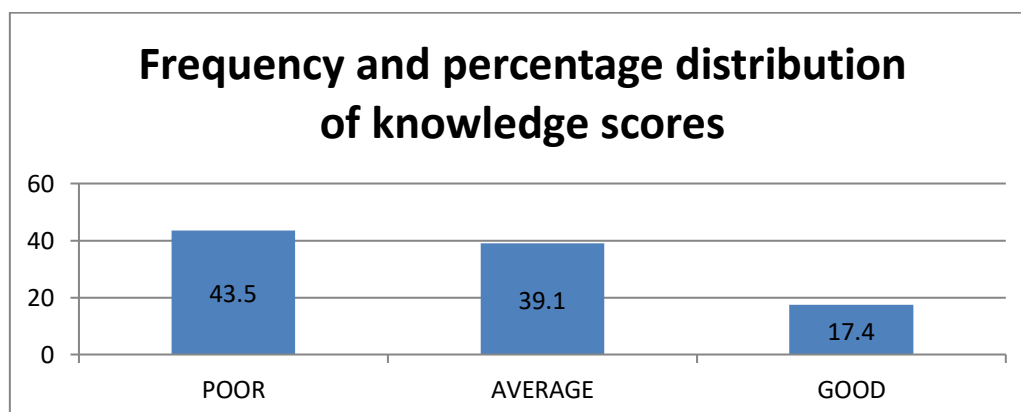
n = 46

S. No	Demographic Variables	Frequency	Percentage
<b>1</b>	<b>Age in Years</b>		
a.	Less than 20	18	39.1
b.	Greater than 20	28	60.9
<b>2</b>	<b>Living area</b>		
a.	Rural	29	63.0
b.	Urban	17	37.0
<b>3</b>	<b>Educational status</b>		
a.	Primary	0	0.0
b.	Secondary	3	6.5
c.	Higher secondary	6	13.1
d.	Graduate	37	84.4
e.	No Formal education	0	0.0
<b>4</b>	<b>Sources of information regarding</b>		
a.	<b>Diarrhoea</b>		
b.	Internet	1	2.2
c.	TV	33	71.7
	News paper	12	26.1

### SECTION-II- Table- 2.1- Frequency and percentage distribution of knowledge scores of Women :

Category and knowledge Score	Frequency (N=46)	Frequency Percentage (%)
<b>POOR (1-10)</b>	20	43.5
<b>AVERAGE (11-20)</b>	18	39.1
<b>GOOD (21-30)</b>	8	17.4
<b>TOTAL</b>	46	100.0

The present table 2.1 concerned with the existing knowledge regarding management of diarrhoea in children in children among Women were shown by knowledge score and it is observed that most of the Women 20 (43.5%) were poor (01-10) knowledge, 18 (39.1%) were have average (11-20) knowledge score and rest of the Women have 8 (17.4%) were from good(21-30) category.

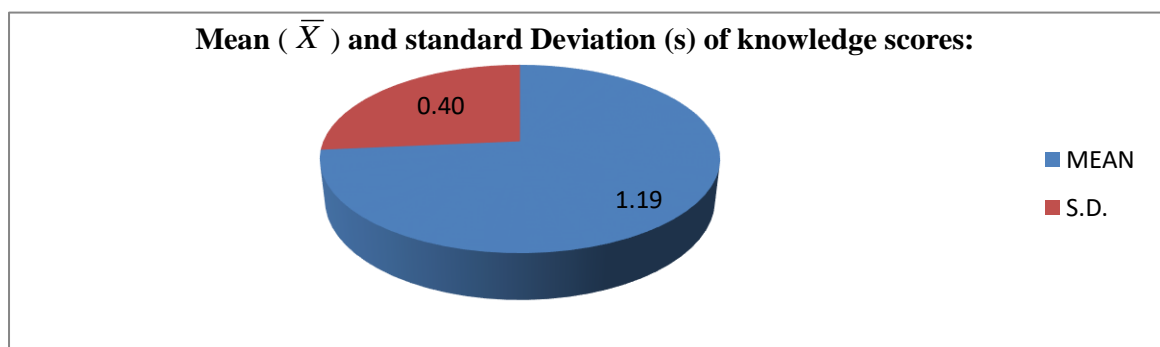


**FIG.-2.1- Frequency and percentage distribution of knowledge scores of Women**

**Table-2.2 - Mean ( $\bar{X}$ ) and standard Deviation (s) of knowledge scores:**

Knowledge score	Mean ( $\bar{X}$ )	Std Dev (S)
	1.19	0.40

The information regarding mean, percentage of mean and standard deviation of knowledge scores is shown in table 2.2 knowledge in mean knowledge score was  $1.19 \pm 0.40$  while in knowledge regarding management of diarrhea in children among Women residing in selected living area.

**Figure no.-2.1 Mean and SD of knowledge score of women.``**

### SECTION-III Association between of knowledge scores and selected demographic variables:

**Table- 3.1 Association of age of Women with knowledge scores:**

Age (In years)	Test scores			Total
	POOR (1-10)	AVERAGE (11-20)	FAIR (21-30)	
Less than 20	7	7	4	18
Greater than 20	13	11	4	28
<b>Total</b>	<b>20</b>	<b>18</b>	<b>8</b>	<b>46</b>
X= 0.54      p>0.05(Insignificant)				

The association of age & knowledge scores is shown in present table 3.1. The probability value for Chi-Square test is 0.54 for 2 DF which indicated insignificant value ( $p>0.05$ ). Hence, it is identified that there is insignificant association between age & knowledge scores. Moreover, it is reflected that age isn't influenced with current problem.

**Table- 3.2 Association of living area with knowledge scores:**

Living area	Knowledge scores			Tot
	POOR (1-10)	AVERAGE (11-20)	FAIR (21-30)	
Rural	15	11	3	29
Urban	5	7	5	17
<b>Total</b>	<b>20</b>	<b>18</b>	<b>8</b>	<b>46</b>
X= 3.49      p>0.05 (Insignificant)				

The association of living area & knowledge scores is shown in present table 3.2. The probability value for Chi-Square test is 3.49 for 2 df which indicated living area& knowledge scores. Moreover, it is reflected that living area isn't influenced with current problem.

**Table- 3.3 Association of educational status with knowledge scores:**

Educational status	Knowledge scores			Total
	POOR (1-10)	AVERAGE (11-20)	FAIR (21-30)	
Primary	0	0	0	0
Secondary	3	0	0	3
Higher sec.	1	2	3	6
Graduate	16	16	5	37
No formal	0	0	0	0
<b>Total</b>	<b>20</b>	<b>18</b>	<b>8</b>	<b>46</b>
X= 9.02 p>0.05 (Insignificant)				

The association of educational status & knowledge score is shown in present table 3.3. The probability value for Chi-Square test is 9.02 for 4 degrees of freedom which indicated educational status and knowledge scores. Moreover, it is reflected that educational status isn't influenced with present problem.

**Table- 3.4 Association of sources of knowledge with knowledge scores:**

Sources of knowledge	Knowledge scores			Total
	POOR (1-10)	AVERAGE (11-20)	FAIR (21-30)	
Internet	0	1	0	1
TV	16	10	7	33
News paper	4	7	1	12
<b>Total</b>	<b>20</b>	<b>18</b>	<b>8</b>	<b>46</b>
X= 4.66 p>0.05 (Insignificant)				

The association of sources of knowledge& knowledge scores is shown in present table 3.4. The probability value for Chi-Square test is 4.66 for 4 degrees of freedom which indicated sources of knowledge & knowledge scores. Moreover, it is reflected that source of knowledge isn't influenced with current problem.

**5. Results:-**The findings of the study revealed that 43.5% wmen have poor knowledge,39.1% have average knowledge score while 17.4% women were having good knowledge score towards management of diarrhoea in children in children. The mean knowledge score of subjects was  $1.19 \pm 0.40$ . The association of knowledge score of Women was found to be statistically insignificant with demographic variables ( $p>0.05$ ).

**6. Conclusion:-**It was concluded that majority of Women had poor knowledge score regarding management of diarrhoea in children in children. Women should also educate regarding management of diarrhoea in children to control disease.

## 7. Limitations

- This was limited to selected Living area, Bundi.
- This was limited to 46 Women.

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## “A descriptive study among ANM students regarding tuberculosis management in children”

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**Abstract-**The current study has been undertaken to assess the Knowledge regarding tuberculosis management in children among ANM Students in selected nursing school, Kota. The research design used for study was descriptive in nature. The tool for study was self-structured knowledge questionnaire which consists of 2 parts-PART- I consisted questions related to Socio-demographic data; PART-II consisted of self -structured knowledge questionnaire to assess the knowledge regarding tuberculosis management in children among ANM Students. The data was analyzed by using descriptive & inferential statistical methods. The most significant finding was that 44.0% students have poor knowledge, 40.0% have average knowledge while 16.0% ANM students were having good knowledge score.

**Keyword-**Tuberculosis Management in children and ANM Students.

### Introduction

As **childhood tuberculosis** (TB) reflects recent transmission, its burden provides an accurate measure of the level of TB control achieved in a particular community. Moreover, infected children represent the main reservoir of Mycobacterium tuberculosis (MTB) as potential future cases. Tuberculosis usually is spread when an infected adult coughs the bacteria into the air. These germs are inhaled by the child, who then becomes infected. Children younger than about ten years old with TB of the lungs rarely infect other people, because they tend to have very few bacteria in their mucus secretions and also have a relatively ineffective cough. TB in humans can be traced back to 9,000 years ago in Atlit Yam, a city now under the Mediterranean Sea, off the coast of Israel. Archeologists found TB in the remains of a mother and child buried together. The earliest written mentions of TB were in India (3,300 years ago) and China (2,300 years ago). Tuberculosis (TB) in children is common wherever TB is common in adults i.e. TB endemic settings.

### Need of the study

**Dorjee K et al (2019)** during initial screening in 2017–2018, we detected a high prevalence of TB disease (916/100,000 schoolchildren) and TBI (19%) in children at Tibetan boarding schools in Himachal Pradesh, where children reside in congregate settings. As a core component of this population-level program across schools, TB preventive treatment (TPT) was implemented using short-course regimens, with a high treatment completion rate (95%).

**Dorjee K et al (2021)** three percent of students were previously treated for TB disease, and 28% reported a TB contact within the previous 2 years. The majority of the schoolchildren (87%) were BCG vaccinated.

Under the NSP (2017-2025), in the state of Madhya Pradesh, there has been significant progress especially in the area of increasing notifications from private sector, expansion of diagnostics services, program architecture and implementation environment for TB control, programmatic management of drug resistant TB (PMDT) service expansion. However, more needs to be done to drastically reduce the TB incidence in Madhya Pradesh which will give impetus to TB elimination in India.

### Objective of the study

- 1.To assess the knowledge scores regarding tuberculosis management in children among ANM Students.
- 2.To find out association between knowledge score regarding tuberculosis management in children among ANM Students with their selected socio demographic variables.

### Hypothesis

**RH<sub>0</sub>:** There will be no significant association between knowledge score regarding tuberculosis management in children among ANM Students with their selected socio demographic variables.

**RH<sub>1</sub>:** There will be significant association between knowledge score regarding tuberculosis management in children among ANM Students with their selected socio demographic variables.

### Methodology

A descriptive research design was used to assess the knowledge score regarding tuberculosis management in children among ANM Students in selected nursing school, Kota. The study was carried out on 50 ANM Students selected by convenience sampling technique. Demographical variable and self-structured 30 knowledge questionnaire were used to assess the knowledge score regarding tuberculosis management in children.

### Analysis and interpretation

#### SECTION-I Table -1.1 Frequency & percentage distribution of samples according to their demographic variables.

n = 50

S.No	Demographic Variables	Frequency	Percentage
<b>1</b>	<b>Age in Years</b>		
a.	Less than 21	20	40.0
b.	Greater than 21	30	60.0
<b>2</b>	<b>Living area</b>		
a.	Rural	36	72.0
b.	Urban	14	28.0
<b>3</b>	<b>Educational status</b>		
a.	Higher secondary	31	62.0
b.	Graduate	19	38.0
<b>4.</b>	<b>Previous knowledge regarding tuberculosis management in children</b>		
a.	Yes	28	56.0
b.	No	22	44.0
<b>4</b>	<b>Sources of information regarding tuberculosis management in children</b>		
a.	Internet	6	12.0
b.	TV	23	46.0
c.	News paper	19	38.0
d.	Conference/workshop	2	4.0

#### SECTION-II- Table-2.1 - Frequency and percentage distribution of knowledge scores of ANM Students:

Category and knowledge Score	Frequency (N=50)	Frequency Percentage (%)
POOR (1-10)	22	44.0
AVERAGE (11-20)	20	40.0

GOOD (21-30)	8	16.0
TOTAL	50	100.0

The present table 2 concerned with the knowledge regarding tuberculosis management in children among ANM Students were shown by knowledge score and it is observed that most of the ANM Students 22 (44.0%) were poor (01-10) knowledge score, 20 (40.0%) were have average (11-20) knowledge score and rest of the ANM Students have 8 (16.0%) were from good (21-30) knowledge score.

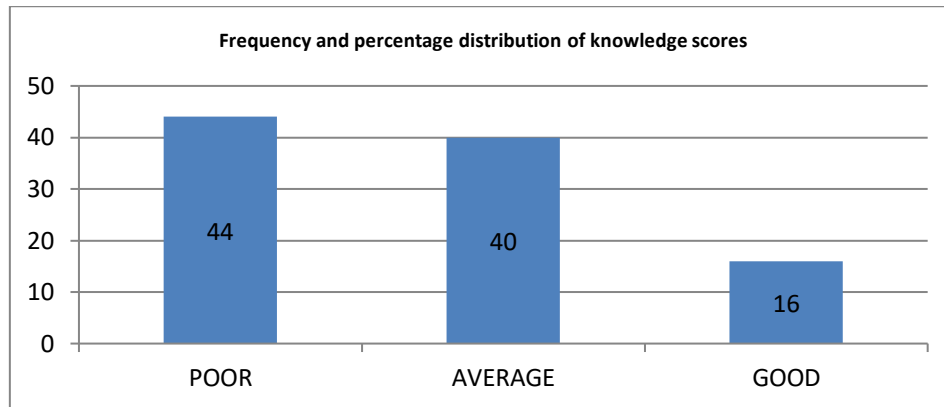


FIG.-2.1 - Frequency and percentage distribution of knowledge scores of ANM Students

Table-2.2 - Mean ( $\bar{X}$ ) and standard Deviation (s) of knowledge scores:

Knowledge score	Mean ( $\bar{X}$ )	Std Deviation (S)
Knowledge score	1.60	0.49

The information regarding mean, percentage of mean and standard deviation of knowledge scores in shown in table 2.2 knowledge in mean score was  $1.60 \pm 0.49$  while in knowledge regarding tuberculosis management in children among ANM Students in selected nursing school.

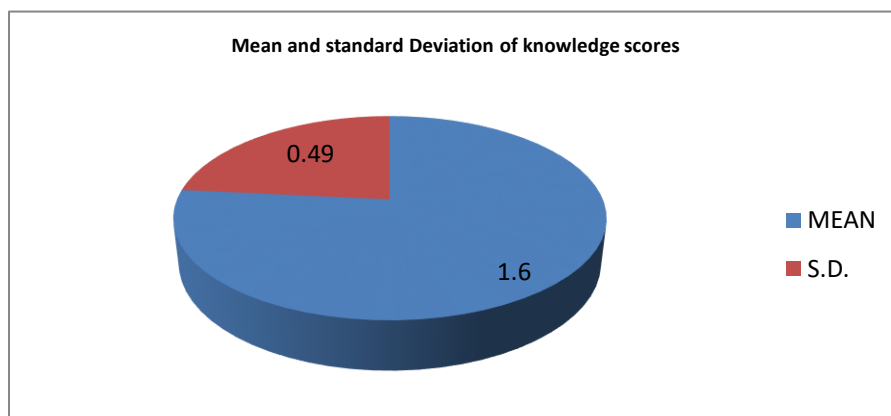


Figure no.-2.2 Mean and SD of knowledge score of ANM Students.

**SECTION-III Association between knowledge scores and selected socio demographic variables:**

**Table- 3.1 Association between knowledge scores and age of ANM Students:**

Age	Test scores			Total
(In years)	<b>POOR (1-10)</b>	<b>AVERAGE (11-20)</b>	<b>FAIR (21-30)</b>	
<b>Less than 21</b>	9	7	4	<b>20</b>
<b>Greater than 21</b>	13	13	4	<b>30</b>
<b>Total</b>	<b>22</b>	<b>20</b>	<b>8</b>	<b>50</b>
X= 0.549                      p>0.05(Insignificant)				

The association of age & knowledge scores is shown in present table 3.1. The probability value for Chi-Square test is 0.54 for 2 degrees of freedom which indicated insignificant value ( $p>0.05$ ). Hence, it is identified that there is insignificant association between age & knowledge scores. Moreover, it is reflected that age isn't influenced with current problem.

**Table- 3.2 Association between knowledge scores and living area:**

Living area	Test scores			Total
	<b>POOR (1-10)</b>	<b>AVERAGE (11-20)</b>	<b>FAIR (21-30)</b>	
<b>Rural</b>	21	12	3	<b>36</b>
<b>Urban</b>	1	8	5	<b>14</b>
<b>Total</b>	<b>22</b>	<b>20</b>	<b>8</b>	<b>50</b>
X=12.15                      p<0.05 (significant)				

The association of living area & knowledge scores is shown in present table 3.2. The probability value for Chi-Square test is 12.15 for 2 degrees of freedom which indicated significant value ( $p<0.05$ ). Hence, it is identified that there is significant association between living area & knowledge scores. Moreover, it is reflected that living area is influenced with current problem.

**Table- 3.3 Association between knowledge scores and educational status:**

Educational status	Test scores			Total
	<b>POOR (1-10)</b>	<b>AVERAGE (11-20)</b>	<b>FAIR (21-30)</b>	
<b>Higher sec.</b>	16	13	2	<b>31</b>
<b>Graduate</b>	6	7	6	<b>19</b>
<b>Total</b>	<b>22</b>	<b>20</b>	<b>8</b>	<b>50</b>
X= 5.80                      p>0.05 (Insignificant)				

The association of educational status & knowledge score is shown in present table 3.3. The probability value for Chi-Square test is 5.80 for 2 degrees of freedom which indicated insignificant value ( $p>0.05$ ). Hence, it is identified that there is insignificant association between educational status & knowledge scores. Moreover, it is reflected that educational status isn't influenced with present problem.

**Table- 3.4 Association between knowledge scores and previous knowledge regarding management of TB:**

Previous knowledge	Test scores			Total
	<b>POOR (1-10)</b>	<b>AVERAGE (11-20)</b>	<b>FAIR (21-30)</b>	
<b>Yes</b>	10	10	8	<b>28</b>
<b>No</b>	12	10	0	<b>22</b>
<b>Total</b>	<b>22</b>	<b>20</b>	<b>8</b>	<b>50</b>
X= 7.57                      p<0.05 (significant)				

The association of previous knowledge & knowledge score is shown in present table 3.4. The probability value for Chi-Square test is 7.57 for 2 degrees of freedom which indicated significant value ( $p < 0.05$ ). Hence, it is identified that there is significant association between previous knowledge & knowledge scores. Moreover, it is reflected that previous knowledge is influenced with present problem.

**Table- 3.5 Association between knowledge scores and sources of knowledge:**

Sources of knowledge	Test scores			Total
	POOR (1-10)	AVERAGE (11-20)	FAIR (21-30)	
Internet	4	2	0	6
TV	9	10	4	23
News paper	7	8	4	19
Conference	2	0	0	2
<b>Total</b>	<b>22</b>	<b>20</b>	<b>8</b>	<b>50</b>
X=5.04                      p>0.05 (Insignificant)				

The association of sources of knowledge & knowledge scores is shown in present table 3.5. The probability value for Chi-Square test is 5.04 for 6 degrees of freedom which indicated insignificant value ( $p > 0.05$ ). Hence, it is identified that there is insignificant association between sources of knowledge & knowledge scores. Moreover, it is reflected that source of knowledge isn't influenced with current problem.

## Results

The findings of the study revealed that 44.0% subjects have poor knowledge score, 40.0% have average knowledge score while 16.0% ANM Students were having good knowledge score towards tuberculosis management in children. The mean knowledge score of subjects was  $1.60 \pm 0.49$ . The association of knowledge score of ANM Students was found to be statistically significant with Living area and previous knowledge regarding management of TB ( $p < 0.05$ ).

## Conclusion

It was concluded that majority of ANM Students had poor knowledge score regarding tuberculosis management in children. ANM Students should also educate regarding tuberculosis management in children to control disease.

## Limitations

- This was limited to selected nursing school, Kota.
- This was limited to 50 ANM Students.

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