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EFFECTIVENESS OF STRUCTURED TEACHING PROGRAM ON KNOWLEDGE REGARDING COLD- CHAIN AMONG GENERAL NURSING MIDWIFERY (GNM) 1ST YEAR STUDENTS AT SELECTED NURSING INSTITUTIONS: A QUASI EXPERIMENTAL STUDY.

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ABSTRACT

Introduction: The "cold chain" is a system of storage and transport of vaccines at low temperature from the manufacturer to the actual vaccination site. The cold chain system is necessary because vaccine failure may occur due to failure to store and transport under strict temperature controls. This is of concern in view of the fairly frequent reports of vaccine preventable disease occurrence in populations thought to have been well immunized.

Methodology: This study was based on quantitative approach. The research design used in this study was Quasi experimental Design. One group pre-test post -test design was used to find the effectiveness of self- instructional module on effectiveness of structured teaching program on knowledge regarding cold-chain among general nursing midwifery (GNM) 1st year students at selected nursing institutions and association of knowledge score with the selected demographic variables.

Results: Mean knowledge score in pre test was 14.11±3.20 and mean percentage of knowledge score in pre test was 47.05%±10.66. After the structure teaching program, mean knowledge score in post-test was 22.50%±2.72 and mean percentage of knowledge score in post test was 75±9.90 and the mean difference was 8.38±4.52. The tabulated value was 2.00. The calculated 't' value i.e. 14.33 which is much higher than the tabulated value.

Conclusion: The study concluded that the post test knowledge score was improved after implementation of structured teaching program. Structured teaching program plays important role in improving the knowledge.

Keywords: Cold chain, structured teaching program, knowledge, General Nursing Midwifery (GNM) 1st year students.

INTRODUCTION

From the producer to the actual immunization location, vaccines are stored and transported at a low temperature using a system known as the "cold chain." The cold-chain method is required because vaccines may not work as intended if they are not stored and transported at precise temperatures. Vaccines must be shielded from the sun and kept away from antiseptics. With the exception of polio, the majority of vaccines can be kept for up to five weeks at health centers. if a strict temperature control between 2 and 8 degrees Celsius is maintained in the refrigerator. Opened multi-dose vials that have not been used completely should be thrown away within an hour if there are no preservatives (which is the case with the majority of live virus vaccines), or within three hours or at the conclusion of a session if there are.[1]

The part of the cold chain is to maintain the energy of vaccines. There's also a conception called 'rear cold chain'. Vaccines must be defended from sun light and contact of antiseptic. At the health centers, utmost vaccines, except polio, can be stored at 4 to 8 ^{0}C for 5 weeks. similar studies help the health workers so that they understand the protocols, routine and critical vaccine storehouse, handling and their responsibility in maintaining the cold chain. Creating mindfulness among people those carrying these vaccines, about the significance of cold chain conservation is very important essential for health care professionals, transportation workers and vaccine storehouse workers.[2]

With a targeted periodic reach of around 2.67 crore babes and 2.9 crore pregnant women, the UIP has become one of the most cost-effective health interventions in the country, significantly reducing the under- 5 mortality rate from 45 per 1000 live births in 2014 to 32 per 1000 live births (SRS 2020). With harmonious sweats to reach and vaccinate all eligible children against vaccine- preventable conditions, the country's Full Immunization Coverage for FY 2023- 24 stands at 93.23 nationally (state-wise Full Immunization Coverage for FY 2023–24).[3]

BACKGROUND OF THE STUDY:

Vaccination is the intervention used to help or wipe out childhood conditions. It's the most cost-effective health intervention. A set of practice guidelines for different service situations were created by the World Health Organization (WHO), which include vaccine monitoring, immunization ways, cold chain operation and reporting systems. The cold chain remains a largely vulnerable point for public immunization programs in developing countries especially those with tropical climates.[4]

Immunization is one of the main factors of primary healthcare. At the supplemental position, primary health center (PHC) is the crucial holder of cold chain system. One of the important elements for perfecting the immunization is cold chain and vaccine logistics operation which is the backbone of immunization program.[5]

NEED OF THE STUDY:

The most effective way to prevent childhood illnesses is through immunization. cold-chain and vaccine logistics management is one of the most crucial components for enhancing immunization. The WHO started the extended program on immunization in 1974 to protect all

children against six vaccine-preventable diseases, and India has the largest immunization program in the world. One of the safest and most efficient ways to prevent childhood illness is through immunization. It is a crucial child survival tactic that dramatically reduces childhood morbidity and mortality rates. Only 43.5% of Indian children had all of their primary vaccinations by the age of 12 months, according to NFHS-3 (2005– 2006) surveys.[6]

Vaccines potency cannot be restored once it has been gone. Therefore, cold chain and vaccine management require a lot of attention and focus in order to carry out the immunization program effectively. The most important individual at a cold chain point (CCP) is the cold chain handler (CCH), whose accurate knowledge and abilities about cold chain procedures, vaccine management, and handling are key to the success of the universal immunization program.[7]

The most important individual at a cold-chain site is the cold-chain handler. after going over a lot of publications and the investigator's own experience. Understanding how to handle and manage cold-chain vaccines is crucial to the success of the universal immunization program. Since GNM students will be the future staff nurses managing the cold chain at the hospital, immunization, and peripheral levels, the researcher felt compelled to evaluate and educate General Nursing Midwifery (GNM) 1st year students on cold chain maintenance.

METHODOLOGY:

Primary objective:

- To assess the effectiveness of structured teaching program on knowledge regarding cold-chain among the General Nursing Midwifery (GNM) 1st year Students at selected nursing institutions.

Secondary objective:

1. To assess the pre - test knowledge regarding cold-chain among the General Nursing Midwifery (GNM) 1stYear Students at selected nursing institutions.
2. To assess the post- test knowledge regarding cold-chain among the General Nursing Midwifery (GNM) 1st Year Students at selected nursing institutions.
3. To evaluate the effectiveness of structured teaching program on knowledge regarding cold-chain among the General Nursing Midwifery (GNM) 1st year Students at selected nursing institutions.
4. To associate the post -test level of knowledge score with selected demographic variables.

Hypothesis: -

Hypothesis will be tested at 0.0 5 level of significance.

Ho-There will be no significant difference between pre-test and post-test knowledge score after giving structured teaching program on knowledge regarding cold-chain among GNM 1st year students in selected nursing institutions.

H_1-There will be significant difference between pre-test and post-test knowledge score after giving structured teaching program on knowledge regarding cold-chain among GNM 1st year students in selected nursing institutions.

Research Approach:
In this study quantitative approach is used.
Research Design:
The research design selected for the present study was Quasi-experimental One group pre-test post-test design.
Setting Of The Study
The present study was conducted in selected nursing institutions after obtaining permission from concerned authority.
Variables: -

- **Independent variables:** The independent variable in this study is structured teaching program.
- **Dependent variables:** The dependent variable in this study is knowledge regarding cold chain.

Population:

In this study population were all General Nursing Midwifery (GNM) 1st year nursing students.

- **Target population:** In this study the target population include General Nursing Midwifery (GNM) 1st Year Students at Selected Nursing Institutions.
- **Accessible population:** The accessible population selected for General Nursing Midwifery (GNM) 1st Year Students at Selected Nursing Institutions and are available during data collection.

Sampling Technique: -

In the present study non probability purposive sampling technique is used.

Sample Size:

In this study, the sample consisted of 60 General Nursing Midwifery (GNM) 1st Year Students at Selected Nursing Institutions

Validity And Reliability

The content and construct validity of the tool was determined by 18 experts; including Community health nursing specialty, MD Community medicine-1, MD Biochemistry department-1, statistician-2 etc. The correlation coefficient 'r' of the questionnaire was 0.8187 which is more than 0.8. Hence the questionnaire was found to be reliable.

Pilot Study:
A sample of 10 adolescents was selected from the educational institution. The investigator approaches the sample individually, discussed the objective of study and obtained consent for participation in study.

Description Of Tool: -

Section A-Questionnaire on demographic Variable: -

- Consist of 6 demographic variables of the General Nursing Midwifery (GNM) 1st year students to be participated in this study e.g. Age, Gender, Religion, Marital-status, Monthly family income (in Rs), Types of family.

Section B- Self- administered Questionnaires: -

- The questionnaire consisted of 30 questions on knowledge about knowledge regarding cold-chain. Total score was 30. Each question carries 1 mark and a zero for the wrong answer.

Ethical Aspect:

The Ethical Committee of the institution has given the approval for this study proposal. Prior permission was obtained from the concerned authority for conducting this study. After explaining all aspects of the study to the participants, written consents were taken from them. All the information obtained from the participant was kept confidential.

RESULT:
Percentage wise distribution of GNM 1st year students according to their demographic variables.

Age: -The distribution of general nursing midwifery (GNM) 1st year students according to their age shows that 71.7% of students were in the group of 17-21 year, 28.3% in 22-26 year.

Gender: -According to gender the distribution of general nursing midwifery (GNM) 1st year students was 18.3% students are males 81.7%, students are females.

Religion: -The religious background showed that 8.3% students are Hindu, 26.7% students are Christian, 65% students are Buddhist.

Marital Status: - It was observed that Distribution of General Nursing Midwifery (GNM) 1st year students according to their marital status are 100% are unmarried.

Monthly family income: - The monthly family income of the participants indicated that 26.7% students having monthly family income of below 10,000 Rs, 28.3% students had monthly family income between 10,001-15,000 Rs, and 26.7% students having between 15,001-20,000 Rs, 18.3% students had monthly family income of more than 20,0001 Rs per month.

Type of family: - It was observed that the distribution of general nursing midwifery (GNM) 1st year students according to type of family that 90% students are belongs to nuclear family and 10% students are belongs to joint-family.

Table 1: Table showing existing level of knowledge score regarding cold-chain among general nursing midwifery (GNM) 1st year students

n=60

Level of pre test knowledge	Score Range	Pretest		Mean Score	SD	Mean Percentage (%)
		Frequency	Percentage	14.11	3.20	47.05
Poor	0-20%(0-6)	0	0			
Average	21-40%(7-12)	21	35			
Good	41-60%(13-18)	33	55			
Very Good	61-80%(19-24)	6	10			
Excellent	81-100%(25-30)	0	0			

Table no 1 shows that 35% general nursing midwifery (GNM) 1st year students having average level of knowledge score, 55% general nursing midwifery (GNM) 1st year students having good level of knowledge score, 10% general nursing midwifery (GNM) 1st year students having very good level of knowledge score and mean knowledge score in pretest was 14.11 and mean percentage score was 47.05%.

Table 2: Table showing post test level of knowledge score regarding cold-chain among general nursing midwifery (GNM) 1st year students

n=60

Level of post test knowledge	Score Range	Post test		Mean score	SD	Mean knowledge (%)
		Frequency	Percentage	22.50	2.72	75
Poor	0-20% (0-6)	0	0			
Average	21-40% (7-12)	0	0			
Good	41-60% (13-18)	5	8.33			
Very Good	61-80% (19-24)	39	65			
Excellent	81-100% (25-30)	16	26.67			

The table no 2 shows that 8.33% of general nursing midwifery (GNM) 1st year students having good level of knowledge score, 65% of general nursing midwifery (GNM) 1st year students

having very good level of knowledge, 26.67% general nursing midwifery (GNM) 1st year students having excellent level of knowledge score and the mean score for post test was 22.50 with a mean knowledge percentage score 75%.

Table 3: Table showing significance of difference between knowledge score in pre test and post test of GNM first year students

n=60

Overall	Mean	SD	Mean Difference	Calculated t-value	df	Tabulated t-value	p-value	Level of significance
Pre-Test	14.11	3.20	8.38±4.52	14.33	59	2.00	0.0001	S, p<0.05
Post-Test	22.50	2.72						

Table 3 describing the pre-test mean is 14.11 and standard deviation is 3.20 and post test mean is 22.50 and standard deviation is 2.72. the mean difference is 8.38±4.52. Mean, standard deviation and mean difference values are compared and student's paired 't' test is applied at 5% level of significance. The tabulated value for n=60-1 i.e. 59 degrees of freedom was 2.00. The calculated 't' value i.e. 14.33 are much higher than the tabulated value at 5% level of significance for overall knowledge score of General Nursing Midwifery (GNM) first year students which is statistically acceptable level of significance. Hence it is statistically interpreted that the Structured Teaching Program on knowledge regarding Cold-Chain among General Nursing Midwifery (GNM) 1st year students from selected Nursing Institutions was effective. Thus, the H_1 is accepted.

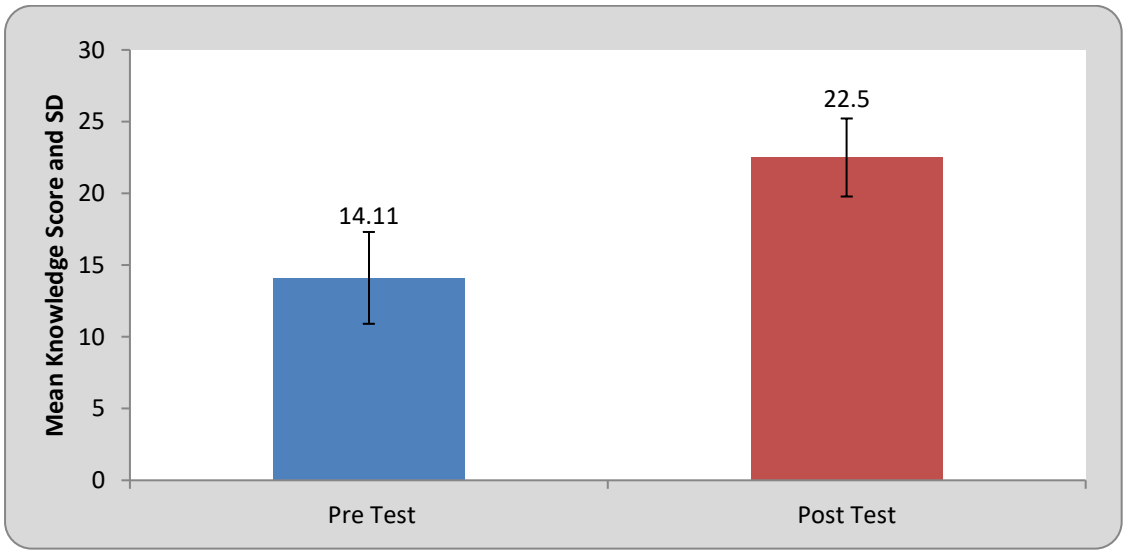

Figure 1: Bar diagram showing significance of difference between knowledge score in pre test and post test regarding cold-chain among General Nursing Midwifery (GNM) 1st year students from selected Nursing Institutions.

Table 4 : Table showing association of Post Test Knowledge Score among GNM first year students in relation to Demographic Variables

n=60

Demographic Variable	Calculated value			df	Tabulated Value	Level of significance< 0.05	Significance
	t-value	F-value	p-value				
Age in years	7.55		0.0001	58	2.00	<0.05	S
Gender	0.06		0.95	58	2.00	>0.05	NS
Religion		1.74	0.18	2,57	4.74	>0.05	NS
Monthly family income (Rs)		11.7	0.0001	3,56	4.76	<0.05	S
Type of family	0.94		0.34	58	2.00	>0.05	NS

S-Significance **NS-Non-significance**

This table 4 shows the association between of Post Test Knowledge Score among GNM first year students in relation to Demographic Variables statistically significant associations were found with age (t=7.55, p=0.0001), Gender (t=0.06, p= 0.95), Religion (F=1.74, p=0.18), Monthly family income (Rs) (F=11.7, p=0.0001), Type of family (t=0.94, p=0.34). Hence it is interpreted that Age in years, Monthly Family Income (Rs) of GNM first year students is statistically associated with their post-test knowledge score and Gender, Religion, Types of family of GNM first year students is statistically not associated with their post- test knowledge score. Hence level of significance for overall knowledge score of General Nursing Midwifery (GNM) first year students which is statistically acceptable level of significance.

DISCUSSION:

Jacob A.M.2018 a quantitative study to assess the knowledge regarding cold chain maintenance among nursing students in selected college of nursing in new delhi. The present study was a descriptive research design. The final study was conducted in Rufaida College of Nursing on 35 Diploma in General Nursing and Midwifery. (DGNM) 2nd year students using total enumeration technique over a period of 1 week. The purpose of the study was explained to them after obtaining their willingness to participate in the study. The result of this study was considered as the sample subjects were given a structured knowledge questionnaire to assess knowledge regarding cold chain maintenance. The conclusion of this study reveals that the primary vaccine failures can occur after high immunization coverage has been achieved.

adequate knowledge and practices in the cold chain system are important to keep potency of vaccines and effectiveness of immunization.[8]

The present study assessed "Effectiveness Of Structured Teaching Program On Knowledge On Cold Chain Among General Nursing Midwifery (GNM) 1st Year Students At Selected Nursing Institutions." A quasi-experimental research design was used for this study, the sampling technique used in the study was non probability purposive sampling technique is total 60 samples selected. The mean and standard deviation of the result reveals that mean score is 14.11 and SD is 3.20 in pre-test and mean score is 22.50 and S.D 2.72 in post-test. the mean difference is 8.38±4.52. Mean, standard deviation and mean difference values are compared and student's paired 't' test is applied at 5% level of significance. The tabulated value for n=60-1 i.e. 59 degrees of freedom was 2.00. The calculated 't' value i.e. 14.33 are much higher than the tabulated value at 5% level of significance for overall knowledge score of General Nursing Midwifery (GNM) first year students which is statistically acceptable level of significance.

CONCLUSION:

The study findings clearly demonstrate that the Structured Teaching Program significantly improved the knowledge of General Nursing Midwifery (GNM) 1st year students regarding cold chain management. In the present study post-test knowledge score of General Nursing Midwifery (GNM) 1st Year Students was higher than pre-test. It shows that shows that 8.33% of the General Nursing Midwifery (GNM) first year students had good level of knowledge score, 65% had very good and 26.67% of General Nursing Midwifery (GNM) first year students had excellent level of knowledge score. Minimum knowledge score in post test was 17 and maximum knowledge score in post test was 29. The tabulated value for n=60-1 i.e. 59 degrees of freedom was 2.00. The post-test scores showed a marked increase compared to pre-test scores, and the calculated t value was highly significant at the 5% level. This indicates that the intervention was effective in enhancing students understanding and awareness about cold chain practices. Therefore, the Structured Teaching Program can be considered a valuable teaching strategy to strengthen knowledge and promote better learning outcomes among nursing students. Hence it is statistically interpreted that the Structured Teaching Program on knowledge regarding Cold-Chain among General Nursing Midwifery (GNM) 1st year students from selected Nursing Institutions was effective. Thus, the H_1 is accepted.

IMPLICATION OF THE STUDY:

The findings of this study have implications for Nursing Practice, Nursing Education, Nursing Administration and Nursing Research.

RECOMMENDATION:

- A similar study can be replicated on a larger population for the generalization of the findings.
- A study was conducted on knowledge, attitude and practices of cold chain handlers regarding cold chain management in district Kanpur.
- A cross-sectional study was conducted for evaluation of cold chain and logistics management practice in Durg district of Chhattisgarh: pointer from Central India.

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CONFLICT OF INTEREST:

The authors certify that they have no involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

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