Original Research Article

A study to assess the knowledge and practice related to maintenance of cold chain among health workers in selected health centre at, Lucknow, U.P

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A B S T R A C T

Background study : Cold chain management is a system of transport and storage of vaccines in a potent state from the time of distribution to the time of administration. Preserving vaccines from its distribution through administration requires adequate cold chain infrastructure, compliance with standards, and effective maintenance. At the end of the chain, are healthcare providers who should have adequate knowledge to maintain the cold chain.

Statement of the problems: The present study entitled "A study to assess the knowledge and practice related to maintenance of cold chain among health workers in selected health centre

Materials and Methods: The study was conducted with the Descriptive research design study was carried out using a structured questionnaire and observational checklist. A purposive sampling method was used in selecting the 60 sample in selected health centre, Lucknow. Data analysis and interpretation data were using descriptive and inferential statistics.

Results: The overall knowledge level of health worker regarding maintenance of cold chain there were (71.66%) of the health workers with inadequate knowledge, (26.66%) of the health worker with moderate knowledge, (1.66%) of health worker with inadequate knowledge regarding maintenance of cold chain and the overall practice level of health worker regarding maintenance of cold chain there were (25%) of the health workers with inadequate practice,(30%) of the health worker with moderate practice,(45%) of health worker with adequate Practice regarding maintenance of cold chain.

1. Introduction

A safe life is basic right. It leads to a longer and more productive life. The safety of each is the responsibility of all. It is well known that with the lamp of knowledge the darkness of ignorance, superstition and diseases are soon dispelled.[1] "Health for All" can be achieved by implementing primary preventive measures like the immunization which is carried out by the health workers, who form the huge work force in the country.3 So, it becomes important to understand the knowledge level and practices of this huge workforce regarding the important preventive measure, i.e., Immunization. Immunization is a cornerstone of public health and one of the most cost-effective interventions available. It has contributed significantly to the decline in child morbidity and mortality in recent decades.[2]

When the Expanded Programme on Immunization (EPI) was launched in 1974, less than 5% of the world's children were immunized during their first year of life against six killer diseases- Poliomyelitis, Diphtheria, Pertussis (whooping cough), Tetanus, Measles and Tuberculosis. Today, nearly 79%of children receive these life saving vaccinations & increasing numbers are also protected by new & under-used vaccines like Hepatitis B. Immunization coverage against Hepatitis B &Hib has been increasing since 1990 more than 160 countries now included Hepatitis B & Hib into infant immunization schedule. However, a quarter of the world's children i.e., about

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26 million infants are not immunized against these six killer diseases. The deadlines for eliminating maternal & neonatal tetanus & certification of global polio eradication by 2005 were not met.[3] The vaccination of children against six serious but preventable diseases Diphtheria, Pertussis, Tetanus, Poliomyelitis, Measles and Tuberculosis has been a cornerstone of child health care system in India.[4] These diseases were brought to focus in 1985 with the collaboration of WHO and UNICEF as universal child immunization programme.[5] The vaccines being immunobiological substances, need to be given in a potent form and at the proper age. If the vaccines loose their potency, it cannot be regained and they will no longer protect an individual. To maintain the potency, a cold chain system for storage and transport of vaccines, at recommended minimum temperatures, from site of manufacturer to actual vaccination site was started.[6]

2. Aim

The aim of this study is to assess knowledge, and practice of cold chain maintenance among health workers.

3. Objectives

1. To assess the level of knowledge regarding maintenance of cold chain among health workers.
2. To assess the level of practice regarding maintenance of cold chain among health workers.
3. To find out the association of knowledge and practice scores regarding maintenance of cold chain with their selected socio-demographic variables.

4. Materials and Methods

Methodology is a systematic way to solve the researcher's problem. This study is a descriptive one to assess the knowledge and practice related to maintenance of cold chain among health workers selected health centre in Lucknow.This chapter deals with brief description of different steps, which are undertaken by the investigator for the study. It includes-Research Approach, Research design, settings, Population, Sample size, variables ,Criteria for sample selection, sample technique, Data collection Tool and technique, Contact validity and reliability of the tools, Data collection and procedure, Pilot study, Data collection procedure, and plan for data analysis.

4.1. Research approach

A survey approach is used, the design used for the study was descriptive design. The rational for the choice is to obtain appropriate data and assessing the knowledge and practice related to maintenance of cold chain among health workers selected health centre in Lucknow.

4.2. Pilot and hunger

[1995] Stated that it also help to collect information on health works knowledge, practice ,opinion and values. In this study Quantitative research design in that Descriptive design is uses.

4.3. Research design

Research design incorporates the most important methods logical decisions that a researcher makes in conducting a research study. It depicts the overall plan for organization of scientific investigation. It helps the research in selection of subjects, manipulation of the independent variable. Observation of a type of statistical analysis to be used to interpret the data (Polit and Hungler 1999). The research design selected for the study Survey approach will be adopted to conduct the study with 60 samples of subjects the design used is depicted in Figure 2.

4.4. Setting of the study

The present study will be undertaken in the selected health centre which belongs to selected health centers of the Lucknow.

4.5. Sample population

The population of present study comprises of health workers working at selected health centres in Lucknow .

4.6. Sample size

Sample is a subset of population selected to participate in the research study .The sample size of the present study comprises of 60 health workers working at the selected health centres of Lucknow.

5. Research Variable

5.1. Independent variable

Selected demographic variables gender, educational level, qualification, area of work place, Year of experience/service, salary of health workers, type of service, In service training program attend at health centre on maintenance of cold chain (within one year)

5.2. Dependent variable

Knowledge, & practices regarding maintenance of cold chain among health workers in selected centres in Lucknow.

6. Criteria for sample selection

The following criteria were set for selection of the sample.

6.1. Inclusion criteria

Health workers currently working in selected Health Centres at, Lucknow.
Health workers who are willing to participate in the study.
Health workers who can understand and read Hindi and English.

6.2. Exclusion criteria

Health workers who are not willing to participate in the study.
Health workers who are on leave on the day of data collection.

6.3. Sampling technique

Purposive sampling technique is a type of non probability sampling approach.

In the present study purpose sampling technique was adopted.

7. Data Collection Tool and Technique

7.1. Instruments used for the study

An instrument selected in a research study should be as far as possible the vehicle that would best obtain data for drawing conclusions which were pertinent to the study (Treace&Trecee, 1982).[45]

The samples for the study will be selected purposively and structured knowledge questionnaire will be used to assess the knowledge of health workers regarding maintenance of cold chain.

An observation check list will be used regarding the practices of health workers about the maintenance of cold chain.

7.2. Data collection method

A structured knowledge questionnaire will be used to assess the knowledge of health workers working at selected health centres.

An observation check list will be used to study the practices of health workers working at selected health centres.

The schedule consists of two parts, part 1 & part 2.

1. Part**:** The investigator will assess the items on demographic variable Like gender, educational level, qualification, area of work place, Year of experience/service, salary of health workers, type of service, In service training program attend at health center on maintenance of cold chain (within one year)
2. Part**:** The investigator will develop a structured knowledge Questionnaire to assess the knowledge of health workers regarding maintenance of cold chain.

3. Part**:** The investigator will develop a standard practice Checklist to assess the practice of health workers regarding maintenance of cold chain.

8. Content Validity and Reliability of the Tools

For the validity of the tool, it was given to the experts from the community health nursing medical field .The expert were asked to go through the structured statement and provide the valuable suggestion on the criterian scale given along with it. The response columns for validating the tools were "fully meets the criteria","and does not meet criteria".

For the content validity of guidelines, it was submitted to experts, including expert from including and medical field. The content was submitted to 9 experts along with the criteria rating scale, The expert were requested to go through the content of the guideline and judge the adequacy and relevancy of content, organization and presentation. Valuable suggestions which were given by the panel of experts will be included in the guidelines.

8.1. Pilot study

Pilot study is a small preliminary investigation of the same general characters as the major study, which is designed to acquaint the researcher with the problem that can be corrected in preparation for a larger project.

8.2. The objectives of the pilot study

1. To utilize the proper place available for the interview.
2. To find out the time required to ask all the questions.
3. To identify whether the subjects understood the wording of questions.
4. To refine the instrument

After having obtained formal administrative approval, a study was conducted from 016.06.20019 to 23.06.20019 at Aliganj community health centre in Lucknow. The subjects who were selected for the pilot study are excluded from the main study.

The investigator did not face any significant problem and the tool was found reliable.

Procedure for Data Collection Prior permission was obtained from the concerned Chief medical officer, Aliganj community health centre in Lucknow, to conduct the study. The investigator used purposive sampling technique to select the study subjects.

Investigator personally visited each respondent, introduced herself to the health worker related maintenance of cold chain and explained the purpose of the study and ascertained the willingness of the participants. The respondents were assured anonymity and confidentiality of the information provided by them. Interviews were conducted during their leisure time.

A comfortable place was selected and the participants were made comfortable. Data was collected with the help of a structured questionnaire and observational checklist, schedule from 01.07.2007 to 16.07.2007. The tool was administered to 6health workers related maintenance of cold chain in Aliganj community health centre in Lucknow. approximately 2 health worker were interviewed per day.The time given for the completion of tool was 25-30 minute to each health worker.

9. Data Collection and Procedure

9.1. Sampling procedure

Non probability purposive sampling technique will be used.

9.2. Population

The population of present study comprises of health workers working at selected health centres in Lucknow.

9.3. Sampling size

Sample size will be 60 health workers working at the selected health centres of Llucknow .

9.4. Duration of study

Duration of study for 3-4 weeks.

9.5. Plan for data analysis

Data analysis will be through descriptive and inferential statistics.

9.6. Descriptive statistics

Mean, Median, Mode, Percentage and Standard deviation will be used to explain demographic variables.

9.7. Inferential statistics

Chi-square test will be used to find out the association between the knowledge scores & selected demographic variables.

The analyzed data will be presented in the form of tables, diagrams & graphs.

9.8. Analysis And Intepretation

In order to find meaningful answers to research questions, the collected data must be processed, analyzed in some orderly coherent fashion, so that patterns and relationships can be discerned (Polit and Hungler, 1999).[7]

1. To assess the knowledge of health worker related to maintenance of cold chain.
2. To assess the practice of health worker related to maintenance of cold chain.

3. Find out the association between knowledge and practices of health workers regarding maintenance of cold chain.

A descriptive and evaluative approach was adopted to evaluate the collected data. The data was collected from health workers was tabulated, analyzed and interpreted by using descriptive and inferential statistics.

The findings were presented under the following sections.

- **Section 1.** Distribution of respondents according to demographic variables.
- **Section 2.** Analysis of level of knowledge and practice of health workers regarding maintenance of cold chain.

1. Mean knowledge score of overall regarding maintenance of cold chain among
2. Data on Aspect wise mean practice score
3. Mean practice score of overall regarding maintenance of cold chain
4. Data on Mean knowledge and practice score of respondents on maintenance of cold chain
5. Classification of respondent by knowledge and practice level

- **Section 3 :** (a)Association between knowledge score and selected variables like gender, educational level, area of work place, Year of experience, Income, Type of service, in-service program attend on maintenance of cold chain (with in one year).
- **Section 3 :** (b)Association between Practice score and selected variables like gender, educational level, area of work place, Year of experience, Income, Type of service, in-service program attend on maintenance of cold chain (with in one year).

Section 2. Analysis of level knowledge and practice of health workers regarding maintenance of cold chain

Table 1The table reveals that overall mean 11.667 score shows inadequate knowledge regarding maintenance of cold chainamong health worker.

Table 2The table reveals aspect wise mean and SD practice score on maintenance of cold chain. the highest mean 5.7 and SD 2 practice score obtained in external followed by mean 5.5 and SD 1.8 practice score in internal mean 3.07 and SD 0.980 practice score was found in the power supply and mean 2.83and SD 0.980 was found in maintenance of cold chain.

Table 3 The above table depicts the association of health workers practice on maintenance of cold chain with their in-service program attend on maintenance of cold chain (with in one year), the calculated value of chi-square (1.472) were less than the table value at 0.05 level of significance.

Table 1: Mean knowledge score of overall regarding maintenance of cold chain among health workers in selected health centre, Lucknow (N=60)

Category	Max. Score	Range	Mean score	SD	Mean percentage
Total knowledge	20	7-16	11.667	2.088	58.335

Table 2: Aspect wise mean practice score of regarding maintenance of cold chain among health workers in selected health centre, Lucknow. (N=60)

Aspect	Max. Score	Range			
External	8	2-8	5.7	2	71.25%
Internal	8	1-8	5.5	1.8	68.75%
Technical	4	1-4	3.07	0.980	76.75%
Power supply and generating set	4	0-4	2.683	0.939	67.075%

Table 3: Association between practice scores of health workers regarding maintenance of cold chain with their selected demographic variables. (N=60)

Demographic variables In service program attend on cold chain	Inadequae f %	Moderate f %	Adequate f %	Chisqure-value 1.472	P- Value 479
Yes	2	5	8		
No	13	13	19		

So there were no significant association exist between in-service program attend on maintenance of cold chain (with in one year), the with their practice.
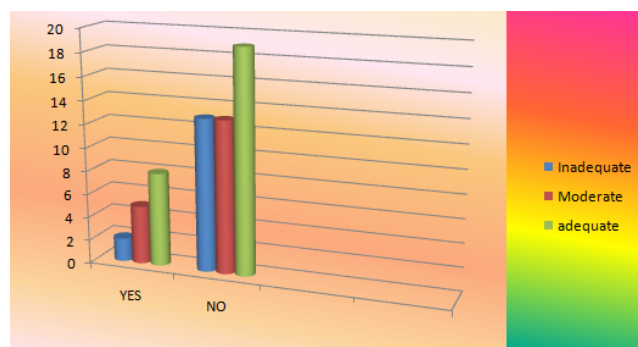

Fig. 1: The above figure illustrate the association of health workers practice on maintenance of cold chain with their in-service program attend on maintenance of cold chain (with in one year), the calculated value of chi-square (1.472) were less than the table value at 0.05 level of significance. So there were no significant association exist between in-service program attend on maintenance of cold chain (with in one year), the with their practice.

10. Discussion

The cold chain is the means by which vaccines are continuously maintained at safe temperatures from the time of manufacture until they are used by the health worker. If the cold chain breaks down at any stage and vaccines are exposed to heat they will not give effective protection. An effective cold chain maintenance system is the backbone of success of any immunization programme.8

The present study is a descriptive survey to assess the knowledge and practice of HealthWorker regarding the maintenance of cold chain in selected health centre at, Lucknow. In order to achieve the objective, descriptive survey approach was adopted. Purposive sampling technique was used to select the sample. The data was collected from 60 worker regarding the maintenance of cold chain in selected health centre at, Lucknow.Content validity of maintenance of cold chain was established by subject experts which is developed on the basis of the results of the study. The content can be used to disseminate knowledge and practice maintenance of cold chain among health workers.

11. Major Findings

1. Majority (98.33%) of the respondents were from the gender of female.
2. Majority (58%) of the respondents were from educational level ANM.
3. Majority (36.66%) of the respondents were from area of workplace CHC .
4. Majority (38.33%) of the respondents were from Year of experience above 11 year experience.
5. Majority (41.66%) of the respondents were from income Rs.10000-20000/month.
6. Majority (60%) of the respondents were from type of service permanent.
7. Majority (75%) of the respondents were from in-service program attend on maintenance of cold chain (with in 1 year).

11.1. Major findings related to respondents by knowledge level of health worker

Inadequate knowledge noticed among 71.66% of the health workers as compared to 16% had moderate knowledge level on maintenance of cold chain.

The overall mean knowledge was found 11.667 (58.335%) and SD as 2.088.

11.2. Major findings related to practice aspect of maintenance of cold chain

Aspect wise mean and SD practice score on maintenance of cold chain. the highest mean 5.7 and SD 2 practice score obtained in external followed by mean 5.5 and SD 1.8 practice score in internal mean 3.07 and SD 0.980 practice score was found in the power supply and mean 2.83 and SD 0.980 was found in maintenance of cold chain

The overall mean practice score was (17.0) in relation to area wise practice score and SD was 4.758.

11.3. Major findings related to respondents by practice level of health worker

The overall practice level of health worker regarding maintenance of cold chain there were 15 number (25%) of the health workers with inadequate practice, 18 number (30%) of the health worker with moderate practice, 27 number (45%) of health worker with adequate Practice regarding maintenance of cold chain.

12. Summary

The study was to assess the knowledge and practice of health worker regarding maintenance of cold chain at selected health centre, Lucknow. Content validity of the structured questionnaire was established by 9 experts. A pilot study was conducted between 16.06.2019 to 23.06.2019. The reliability of the tool was established by split half technique developed by Spearman's Brown Prophecy formula. The reliability coefficient was found to be 0.94, hence the tool was found to be reliable. Purposive sampling technique was used to select the samples. The sample consists of 60 health worker and data was collected at selected health centre,Lucknow.

13. Conclusion

The purpose of this study was to assess the knowledge and practice of health worker related maintenance of cold chain. The results were discussed and the following conclusions were drawn.

1. The health worker hadless knowledge(Mean=11 667 58 335 percent
2. The practice score was more than the knowledge (Mean = (17.0) 70.6375 percent. This could be justified

as health worker have some knowledge about the cold chain maintenance. They have more aware of practice in maintenance of cold chain in order to know the subject knowledge. So the health worker had to be educated regarding maintenance of cold chain.

3. From the present study it was concluded that In-service program attend on cold chain (with in 1 year) of the health worker were significantly associated in assessment of knowledge. Hence, knowledge on maintenance of cold chain of health workers inadequate. Educational level and area of work place, significantly associated with the practice. Hence, knowledge on cold chain of health workers inadequate than practice. Also the training of the health worker plays an important role in practice. This might be due to their experience come practice in services.
4. From this study it was concluded that type of gender and their knowledge were no significantly associated. The gender female were involved in primary health care delivery system for that had higher percentage of knowledge. This might be due to in-service program attend (with in one year)

14. Source of Funding

None.

15. Conflict of Interest

None.

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