



A Pre-Experimental Study to Evaluate the Effectiveness of Structured Teaching Program on Knowledge and Attitude Regarding Cold Chain Storage among Health Workers Working in Selected Hospitals of District Patiala, Punjab

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Introduction:

Over the last century, immunization has been the most powerful medical strategy to control infectious diseases. Most viral and bacterial diseases usually affecting the children worldwide are now preventable by vaccines. Vaccination is estimated to save at 2-3 million lives every year. Vaccination is probably one of the most cost-effective interventions to reduce burden of childhood morbidity and mortality rate.

The cold chain is a system of storage and transport of vaccines at low temperature from the manufacturer to the actual vaccination site. The role of the cold chain is to maintain the potency of vaccines. There is also a concept called 'reverse cold chain'. Among all vaccines, polio is the most heat sensitive, requiring storage at -20°C. Polio and measles vaccines must be stored in the freezer compartment. DPT, DT, TT, BCG, Typhoid and diluents of vaccines must be stored in the cold part and never allowed to freeze. Vaccines must be protected from sun light and contact of antiseptic. At the health centers, most vaccines, except polio, can be stored at 4 to 8°C for 5 weeks.

Problems related to cold chain implementation and vaccine management have been reported from developed and developing countries. Such studies help the health workers so that they understand the protocols, routine and urgent vaccine storage, handling and their responsibility in maintaining the cold chain. Creating awareness among people those carrying these vaccines, about the importance of cold chain maintenance is very much essential for health care professionals, transportation workers and vaccine storage workers.

Objectives:

1. To assess the socio-demographic variables.
2. To assess the pre-test knowledge score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.
3. To assess the pre-test attitude score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.
4. To develop and implement structured teaching program regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.
5. To assess the post-test knowledge score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.
6. To assess the post-test attitude score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.
7. To assess the effectiveness of structured teaching program on knowledge score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.
8. To assess the effectiveness of structured teaching program on attitude score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.
9. To find out association of pre-test knowledge score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab, with their selected socio demographic variables.

10. To find out association of pre-test attitude score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab, with their selected socio demographic variables.

Methodology:

The **quantitative research approach** with **pre experimental one-group pre-test post-test design** was selected for study. The **sample size** of the study comprised of **40 health workers**. In this study, **purposive sampling technique** was used.

Description of tool:

Research tool was consists of 3 parts:

- Section A:** It consists of socio-demographic variables of health workers. It includes age, gender, qualification, experience and source of information.
- Section B:** It consists of self-structured knowledge questionnaire to assess the knowledge of health workers.

LEVEL OF KNOWLEDGE	SCORE RANGE	PERCENTAGE
Poor	0-10	≤33%
Average	11-20	34-66%
Good	21-30	67-100%

Maximum score=30

Minimum score=0

- Section C:** Likert scale to assess the attitude of health workers.

LEVEL OF ATTITUDE	SCORE RANGE	PERCENTAGE
Negative attitude	15-35	≤33%
Neutral	36-55	34-66%
Positive attitude	56-75	67-100%

Maximum Score=75

Minimum score=0

Objective 1: To assess the Socio demographic variables of health workers.

S. No	Socio demographic variables of health workers	Frequency	(%)
1.	Age		
1.1	Below 25	22.5%	9
1.2	25≥35	45.0%	18
1.3	35≥45	32.5%	13
1.4	Above 45	0.0%	0
2.	Gender		
2.1	Male	17.5%	7
2.2	Female	82.5%	33
3.	Qualification		
3.1	A.N.M.	2.5%	1
3.2	G.N.M.	32.5%	13
3.3	Post Basic B.Sc. Nursing	42.5%	17
3.4	B.Sc. Nursing	22.5%	9
3.5	M.Sc. Nursing	0.0%	0
4.	Experience (in years)		
4.1	0-5	60.0%	24
4.2	6-10	25.0%	10
4.3	11-15	15.0%	6
4.4	Above 15	0.0%	0
5.	Source of information regarding cold chain storage		
5.1	Mass media	82.5%	33
5.2	Colleagues	17.5%	7
5.3	In service education	0.0%	0
5.4	Others	0.0%	0

Table 4.1 Show the percentage distribution of socio-demographic variables of health workers.

In this study majority (45.0%) of data represented that health workers belongs to **age** group of 25-35 years, (32.5%) belongs to below 35-45 years, (22.5%) belongs to below 25 years. The study revealed that (82.5%) of the health workers were **females** and (17.5%) of health workers were **males**. The study findings showed that majority (42.5%) of health workers were having **Post-Basic B.Sc. nursing** qualification while (32.5%) having **G.N.M.** qualification, (22.5%) having **B.Sc. nursing** qualification and (2.5%) having **A.N.M.** The study findings showed that majority (60.0%) of health workers had **experience** of 0-5 years. Health workers who had 6-10 year experience represented (25.0%) and (15.0%) health workers had 11-15 year experience. The study revealed that majority (82.5%) of health workers had **mass media** as a source of information and (17.5%) had **colleagues** as a source of information.

Objective: 2 To assess the pre-test knowledge score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.

Table No: 4.2 Shows percentage and frequency distribution of pre-test knowledge score of health workers regarding cold chain storage.

CRITERIA MEASURE OF PRETEST KNOWLEDGE SCORE	
Level of score	Pre-test, f (%)
Poor (0-10) ≤33%	0 (0%)
Average (11-20) 34-66%	27 (67.5%)
Good (21-30) 67-100%	13 (32.5%)
Maximum Score=30	Minimum Score=0

Table No. 4.2 Shows that majority (67.5%) of health workers had average pre-test knowledge score and (32.5%) had good pre-test knowledge score regarding cold chain storage.

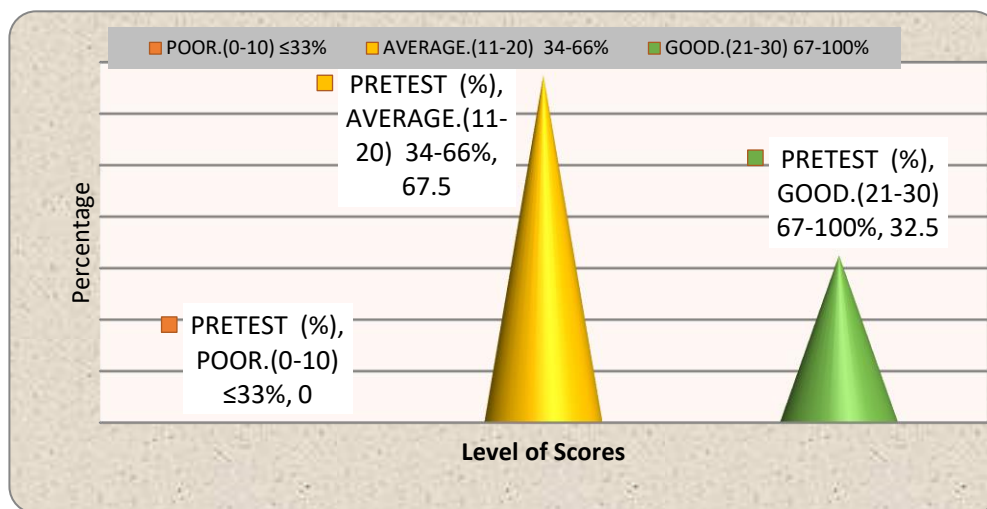


Table No. 4.3 Shows mean, median, range and standard deviation of pre-test knowledge score of health workers regarding cold chain storage.

Criteria	Mean	S.D.	Median	Maximum	Minimum	Range	Mean%
Pre-test knowledge	19.05	3.686	19	27	11	16	63.50

Maximum =30

Minimum=0

Objective 3: To assess the pre-test attitude score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.

Table No: 4.4 Shows percentage and frequency distribution of pre-test attitude score of health workers regarding cold chain storage.

CRITERIA MEASURE OF PRETEST ATTITUDE SCORE	
Level of score	Pre-test, f (%)
Negative attitude (15-35)	0 (0%)
Neutral (36-55)	30 (75%)
Positive attitude (56-75)	10 (25%)
Maximum Score=75	Minimum Score=15

Table No. 4.4 Shows percentage distribution of pre-test attitude score of health workers regarding cold chain storage. Shows that majority (75%) of health workers had neutral attitude, followed by (25%) having positive attitude.

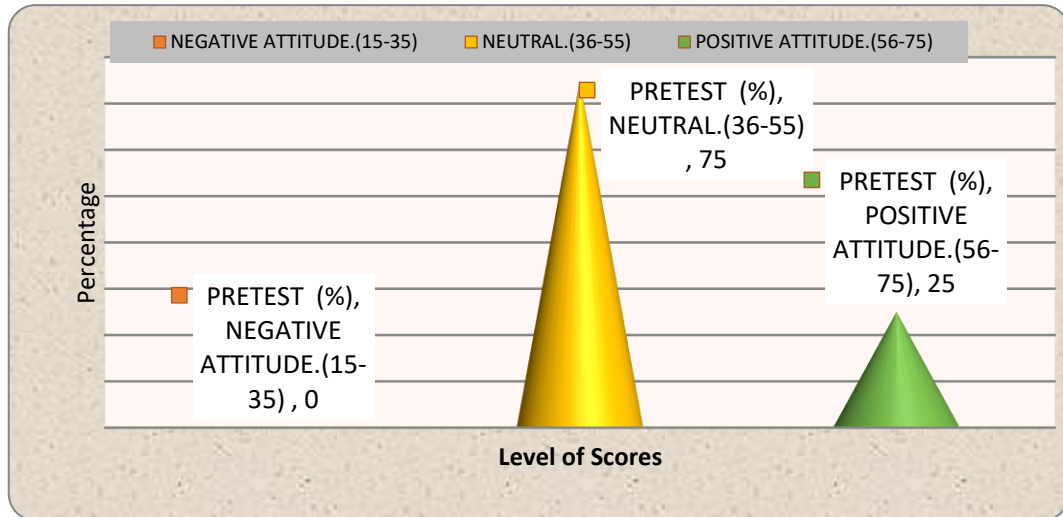


Table No. 4.5 Shows mean, median, range and standard deviation of pre-test attitude score of health workers regarding cold chain storage.

Criteria	Mean	S.D.	Median	Maximum	Minimum	Range	Mean%
Pre-test attitude	50.68	6.553	50.5	64	37	27	67.60

Maximum =75

Minimum=15

Objective 4: To assess the post-test knowledge score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.

Table No: 4.6 Shows percentage and frequency distribution of post-test knowledge score of health workers regarding cold chain storage.

CRITERIA MEASURE OF POSTTEST KNOWLEDGE SCORE	
Level of score	Pre-test, f (%)
Poor (0-10) ≤33%	0 (0%)
Average (11-20) 34-66%	5 (12.5%)
Good (21-30) 67-100%	35 (87.5%)
Maximum Score=30	Minimum Score=0

Table No. 4.6 Shows that majority (87.5%) of health workers had good post-test knowledge score and (12.5%) had average post-test knowledge score regarding cold chain storage.

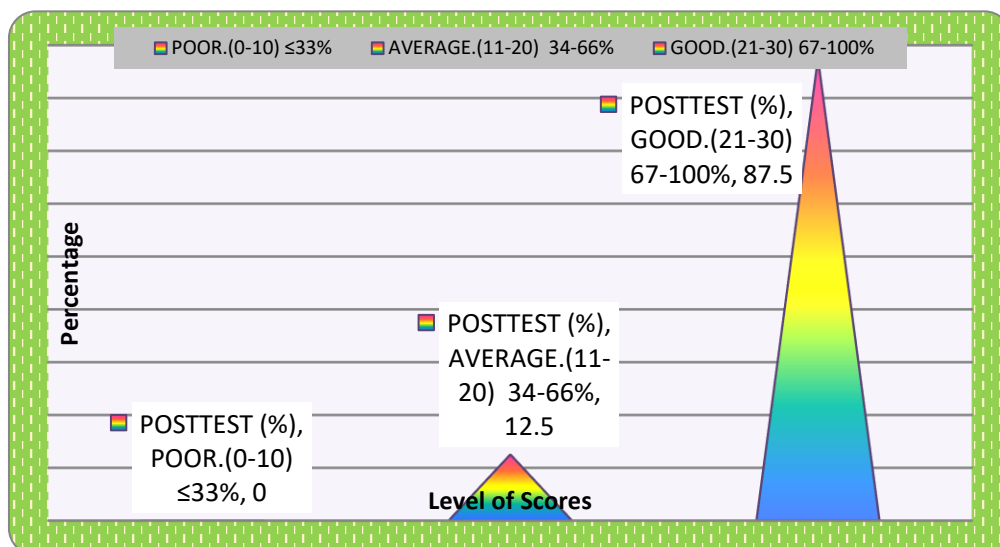


Table No: 4.7 Mean, Median, Range and SD of post-test knowledge score of health workers regarding cold chain storage.

Criteria	Mean	S.D.	Median	Maximum	Minimum	Range	Mean%
Pre-test knowledge	23.65	2.304	23.5	28	19	9	78.80

Maximum =30

Minimum=0

Objective 5: To assess the post-test attitude score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.

Table No: 4.8 Shows percentage and frequency distribution of post-test attitude score of health workers regarding cold chain storage.

CRITERIA MEASURE OF POST TEST ATTITUDE SCORE	
Level of score	Post-test, f (%)
Negative attitude (15-35)	0 (0%)
Neutral (36-55)	9 (22.5%)
Positive attitude (56-75)	31 (77.5%)
Maximum Score=75	Minimum Score=15

Table No. 4.8 Shows percentage distribution of post-test attitude score of health workers regarding cold chain storage. Shows that majority (77.5%) of health workers had positive attitude, followed by (22.5%) having neutral attitude.

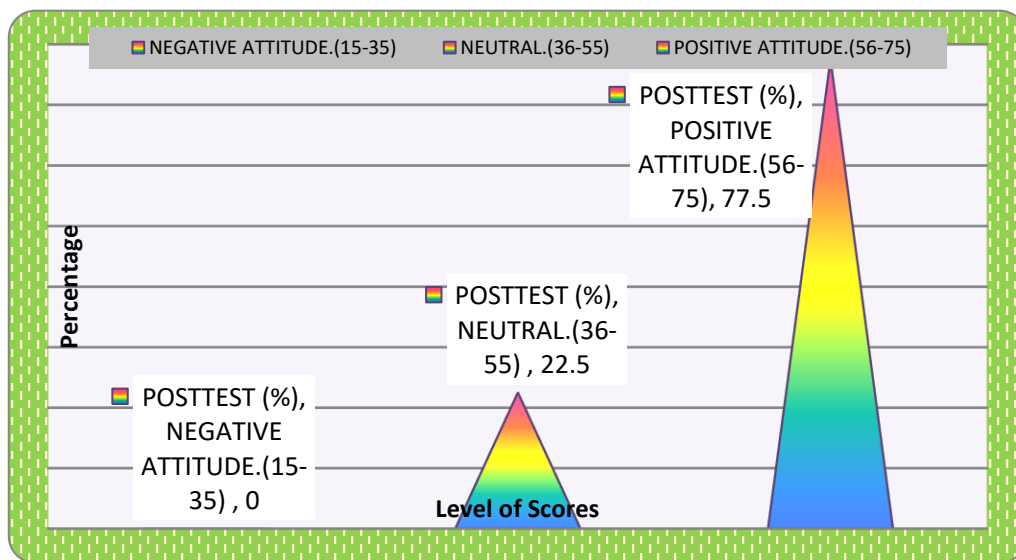


Table No: 4.9 Shows mean, median, range and standard deviation of post-test attitude score of health workers regarding cold chain storage.

Criteria	Mean	S.D.	Median	Maximum	Minimum	Range	Mean%
Post-test attitude	60.65	6.258	60.5	73	50	23	80.90

Maximum =75

Minimum=15

Objective 6: To assess the effectiveness of structured teaching program on post-test knowledge score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.

Table No. 4.10 Shows percentage and frequency distribution of pre-test and post-test knowledge score of health workers regarding cold chain storage.

CRITERIA MEASURE OF KNOWLEDGE SCORE		
Level of score	Pre-test, f (%)	Post-test, f (%)
Poor (0-10) ≤33%	0 (0%)	0 (0%)
Average (11-20) 34-66%	27 (67.5%)	5 (12.5%)
Good (21-30) 67-100%	13 (32.5%)	35 (87.5%)
Maximum score=30	Minimum score=0	

Table No. 4.10 Shows percentage distribution of pre-test and post-test knowledge score of health workers regarding cold chain storage shows that majority (67.5%) of health workers had average pre-test knowledge score, followed by (32.5%) having good in pre-test knowledge score. In post-test knowledge score majority (87.5%) of health workers had good knowledge score, followed by (12.5%) having average knowledge score regarding cold chain storage.

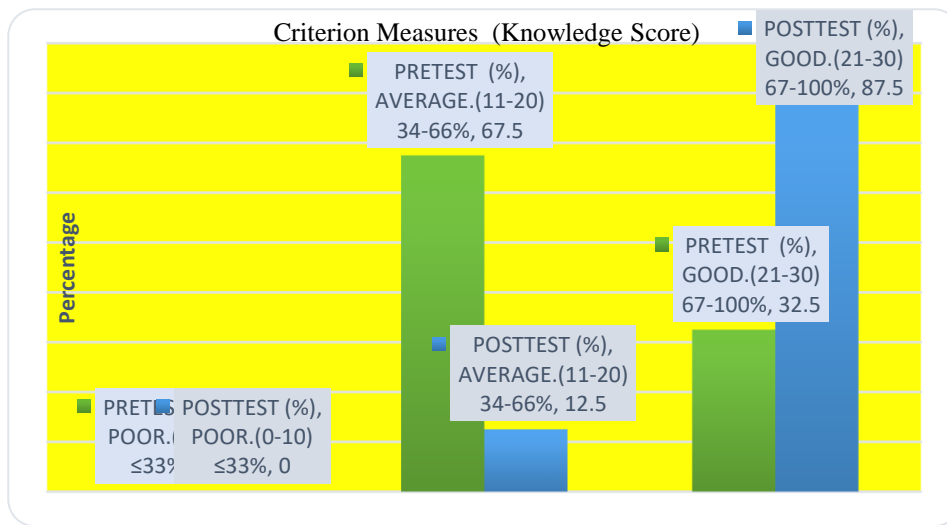


Table No 4.11: Comparison of pre-test and post-test knowledge score of health workers regarding cold chain storage.

Criteria	Mean±S.D.	Mean%	Range	Mean Diff.	Paired t Test	P value	Table value at 0.05
Pre-test knowledge	19.05±3.686	63.50	11-27	4.600	6.745 *Significant	<0.01	2.02
Post-test knowledge	23.65±2.304	78.80	19-28				

*Significance level 0.05 Maximum =30 Minimum=0

Table No. 4.12 Showing Individual Score Gain of pre-test and post-test knowledge score of health workers regarding cold chain storage.

Criteria	Pre-test Knowledge	Post-test Knowledge	Difference	Pre-test Knowledge Score %	Post-test Knowledge Score %	Difference%
Average	19.05	23.65	4.60	63.50	78.83	15.33

Table No. 4.12 depicts that mean pre-test knowledge score was 19.05 (63.50%) and mean post-test knowledge score was 23.65 (78.83%) with the difference of 4.60 (15.33%). There was significant difference in mean pre-test knowledge score and post-test knowledge score.

Objective 7: To assess the effectiveness of structured teaching program on post-test attitude score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab.

Table No. 4.13 Shows percentage and frequency distribution of pre-test and post-test attitude score of health workers regarding cold chain storage.

CRITERIA MEASURE OF ATTITUDE SCORE		
Level of score	Pre-test, f (%)	Post-test, f (%)
Negative attitude (15-35)	0 (0%)	0 (0%)
Neutral (36-55)	30 (75%)	9 (22.5%)
Positive attitude (56-75)	10 (25%)	31 (77.5%)
Maximum score=75		Minimum score=15

Table No. 4.13 Shows percentage distribution of pre-test and post-test attitude score of health workers regarding cold chain storage shows that majority (75%) of health workers had neutral pre-test attitude score, followed by (25%) having positive, in pre-test attitude score. In post-test attitude score majority (77.5%) of health workers had positive attitude score, followed by (22.5%) having neutral attitude score regarding cold chain storage.

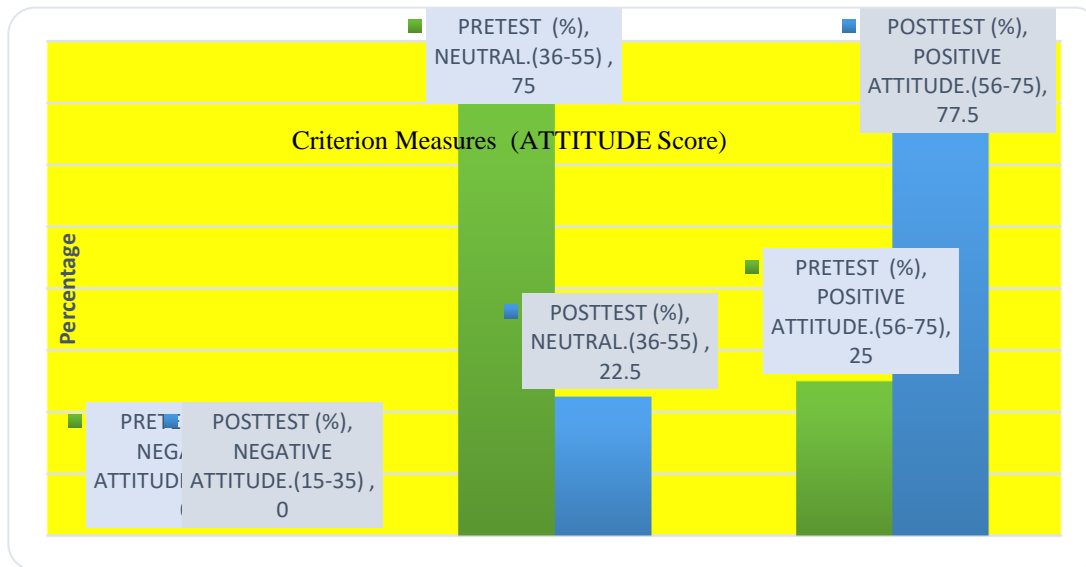


Table No: 4.14 Comparison of pre-test and post-test attitude score of health workers regarding cold chain storage.

Criteria	Mean±S.D.	Mean%	Range	Mean Diff.	Paired t Test	P value	Table value at 0.05
Pre-test attitude	50.68±6.553	67.60	37-64	9.970	6.72 *Significant	<0.01	2.02
Post-test attitude	60.65±6.258	80.90	50-73				

*Significance level 0.05 Maximum =75 Minimum=15

Table No. 4.15 Showing Individual Score Gain of pre-test and post-test attitude score of health workers regarding cold chain storage.

Criteria	Pre-test Attitude Score	Post-test Attitude Score	Difference	Pre-test Attitude Score %	Post-test Attitude Score %	Difference%
Average	50.68	60.65	9.970	67.60	80.90	13.3

Table No. 4.15 depicts that mean pre-test attitude score was 50.68 (67.60%) and mean post-test attitude score was 60.65 (80.90%) with the difference of 9.970 (13.3%). There was significant difference in mean pre-test attitude score and post-test attitude score.

Objective 8: To find out association of pre-test knowledge score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab, with their selected socio demographic variables.

Table No: 4.16 Shows association of pre-test knowledge score with their selected socio-demographic variables of health workers regarding cold chain storage.

Association of Pre-test Knowledge Scores with their Selected Socio-Demographic Variables								
Socio demographic variables	Options	Good	Average	Poor	Chi-Test	df	Table Value	Result
Age in years	Below 25	2	7	0	0.650	2	5.991	Not Significant
	25≥35	6	12	0				
	35≥45	5	8	0				
	Above 45	0	0	0				

Gender	Male	1	6	0	1.283	1	3.841	Not Significant
	Female	12	21	0				
Qualification	A.N.M.	0	1	0	1.186	3	7.815	Not Significant
	G.N.M.	5	8	0				
	Post Basic B.Sc. Nursing	6	11	0				
	B.Sc. Nursing	2	7	0				
	M.Sc. Nursing	0	0	0				
Experience (In years)	0-5	9	15	0	0.988	2	5.991	Not Significant
	6-10	2	8	0				
	11-15	2	4	0				
	Above 15	0	0	0				
Source of information regarding cold chain storage	Mass media	12	21	0	1.283	1.283	3.841	Not Significant
	Colleagues	1	6	0				
	In service education	0	0	0				
	Others	0	0	0				

Table No. 4.16 Shows the association of pre-test knowledge score with their selected socio-demographic variables. The chi-square test was used to determine the association of pre-test knowledge score with their selected socio-demographic variables. The calculated chi-square value (Age, Gender, Qualification, Experience and Source of information) was less than the table value at the 0.05 level of significance. Hence, null hypothesis was accepted. Thus, H_2 was rejected. There was no significant association of pre-test knowledge score with their selected socio-demographic variables.

Objective 9: To find out association of pre-test attitude score regarding cold chain storage among health workers working in selected hospitals of District Patiala, Punjab, with their selected socio demographic variables.

Table No: 4.17 Shows association of pre-test attitude score with their selected socio-demographic variables of health workers regarding cold chain storage.

Association of Pre-test Attitude Scores with their Selected Socio-Demographic Variables								
Socio demographic variables	Options	Positive attitude	Neutral	Negative attitude	Chi Test	df	Table Value	Result
Age in years	Below 25	1	8	0	1.618	2	5.991	Not Significant
	25≥35	6	12	0				
	35≥45	3	10	0				
	Above 45	0	0	0				
Gender	Male	1	6	0	0.519	1	3.841	Not Significant
	Female	9	24	0				
	A.N.M.	0	1	0	2.246	3	7.815	Not Significant
	G.N.M.	3	10	0				

Qualification	Post Basic B.Sc. Nursing	6	11	0				
	B.Sc. Nursing	1	8	0				
	M.Sc. Nursing	0	0	0				
Experience (In years)	0-5	7	17	0	0.578	2	5.991	Not Significant
	6-10	2	8	0				
	11-15	1	5	0				
	Above 15	0	0	0				
Source of information regarding cold chain storage	Mass media	9	24	0	0.519	1.283	3.841	Not Significant
	Colleagues	1	6	0				
	In service education	0	0	0				
	Others	0	0	0				

Table No. 4.17 Shows the association of pre-test attitude score with their selected socio-demographic variables. The chi-square test was used to determine the association of pre-test attitude score with their selected socio-demographic variables. The calculated chi-square value (Age, Gender, Qualification, Experience and Source of information) was less than the table value at the 0.05 level of significance. Hence, null hypothesis was accepted. Thus, H_2 was rejected. There was no significant association of pre-test attitude score with their selected socio-demographic variables.

Recommendations:

Based on the study, the following recommendations are put forward for the future research

1. A study can be conducted to assess the attitude of health workers working in selected hospitals of district Patiala, Punjab.
2. A study can be replicated with a large number of samples in different settings for better generalization.

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