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Effectiveness of Structured Teaching Programme on Knowledge Regarding Breast Cancer Among Students of Selected Sr. Sec. Schools of District Solan Himachal Pradesh: A Quasi-Experimental Study

Vandana Chandel[1], Raghunandan Singh[2], Nitika Sharma[3]

[1]Masters of Science in Medical and Surgical Cardio-Vascular Thoracic Nursing, Murari Lal Memorial School and College of Nursing, Oachghat, Solan, Himachal Pradesh 173223, India
Email: *vandanathakur88827[at]gmail.com*

[2]Professor, Medical Surgical Nursing, Murari Lal Memorial School and College of Nursing, Oachghat, Solan, Himachal Pradesh 173223, India
Email: *rnandanshorty[at]gmail.com*

[3]Assistant Professor, Medical Surgical Nursing, Murari Lal Memorial School and College of Nursing, Oachghat, Solan, Himachal Pradesh 173223, India
Email: *Sharmanitika587[at]gmail.com*

Abstract: ***Breast cancer is the common cancer among women worldwide and a leading cause of cancer-related mortality. Early detection through breast self-examination and screening can improve survival rates. Educating adolescents helps in promoting lifelong preventive health practices. The study aimed to assess pre-test and post-test knowledge regarding breast cancer among students in experimental and control groups, evaluate the effectiveness of a structured teaching programme, and determine the association between post-test knowledge scores and socio-demographic variables. A quantitative, quasi-experimental non-equivalent pre-test post-test control group design was adopted. The study was conducted in Government Senior Secondary Schools of District Solan, Himachal Pradesh. Eighty students were selected by convenience sampling and divided into experimental (n=40) and control (n=40) groups. Data were collected using a self-structured knowledge questionnaire. The experimental group demonstrated a significant increase in mean knowledge score from 15.68 ± 1.90 (39.2%) to 32.70 ± 2.83 (81.75%) after the intervention (p<0.001), whereas the control group showed no significant improvement (p=0.568). No significant association was found with socio-demographic variables except area of residence. The structured teaching programme was effective in improving students' knowledge regarding breast cancer. Regular health awareness programmes are recommended to promote preventive practices and reduce the future burden of breast cancer.***

Keywords: Breast cancer, Adolescents, Structured teaching programme, Breast self-examination

1. Introduction

Breasts are symbols of strength, nurture and individuality. They remind us that everybody is worthy of respect and care, regardless of shape or size. Every woman's body is a canvas of empowerment, that tell stories of strength, resilience and life's true essence.

-Sonya Renee Taylor

Adolescence is a changing stage of physical and mental human development generally occurring between puberty and adulthood. It is an important stage of human development and base of good health. During this phase, adolescence form patterns of behaviour, diet, physical activity, substance use, sexual activity etc. To develop in good health adolescents needs good information, including age-appropriate education.[1]

A women breast made up of lobules that make breast milk and connective tissues, blood vessels and lumps vessels. Breast cancer is a defined as a disease where abnormal cells in the breast tissue that grow out of control, possibly forming tumours that can spread to other parts of the body. Mostly breast cancer begins in the cells, which line the ducts that begins in the lobule and other tissue. Breast cancer mainly starts from inner lining of milk ducts and lobules that supply milk. Breast cancer should be benign or malignant that can spread all over all both breasts. Sometime breast cancer spreads to other body parts like, bones, lung, liver, lymph, pelvis etc.[2]

Breast cancer affects more than 2million of people every year. In 2022, there were 2.3 million women diagnosed with breast cancer and 6,70,000 deaths globally. Breast cancer occurs in every country of the world in women at any age after puberty but with increasing rates in later life. Global estimates reveal striking inequities in the breast cancer burden according to human development. For example, in countries with a very high Human Development Index (HDI), 1 in 12 women will be diagnosed with breast cancer in their lifetime and 1 in 71 women die of it. In contrast, in countries with a low HDI; while only 1 in 27 women is diagnosed with breast cancer in their lifetime, 1 in 48 women will die from it.[3]

In India, cancer prevalence is estimated around 2.5 million, with over 0.8 million new cases and 0.5 million deaths occurring each year. The common sites for cancer in India for females are cervix, breast, and oral cavity. Breast cancer accounts for 19%–34% of all cancer cases among women in India. According to the National Cancer Registries and Regional Cancer Centers, breast cancer is the most common cancer diagnosed in Delhi, Mumbai, Ahmadabad, and Kolkata. In India, the number of new breast cancer cases is about 115,000 per year and this is expected to rise to 250,000 new cases per year. The peak age for occurrence of breast cancer in developed countries is above the 50 years, as compared to India, where it occurs in a younger age group. The worldwide, death rate from breast cancer is 666,103. India has more death rate in top countries with data 98,337, China has 74,986 death rate and US has 42,900 death rates.[4]

The prevention of breast cancer depends on targeting factors that increase the risk of cancer, not all factors can be modified only some of risk factors can be modifiable. The modified factors include healthy diet, exercises, early treatment of infectious disease, avoidance of harmful products consumption, pregnancy and nursery, obesity which is the most leading cause of cancers. Educational interventions can significantly improve adolescent girls' knowledge about breast cancer its causes, risks, symptoms, and majorly focuses on prevention methods like early detection of breast cancer with BSE.[5]

All women and girls should be aware about breast cancer. It is important to get rid of the myths that people wrongly believe, inform them about the signs and symptoms, and importance of screening for early detection. It is also vital to follow a healthy lifestyle, and sharing of survivor stories gives a message of hope and confidence. Education about regular breast self-examination is necessary to detect breast cancer at early stages.[6]

2. Problem Statement

A study to assess the effectiveness of structured teaching programme on knowledge regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh.

3. Aim of the Study

The aim of the study is to assess the effectiveness of structured teaching programme on knowledge regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh.

4. Objectives

1) To assess the pre-test knowledge score regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental and control group.
2) To assess the post-test knowledge score regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group and control group.
3) To assess the effectiveness of structured teaching programme on knowledge regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group.
4) To determine the association between post-test knowledge score regarding breast cancer with their selected socio-demographic variables among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group and control group.

Hypothesis

H_{01}: There will not be a significant difference between the mean pre-test and post-test knowledge score regarding breast cancer in selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group.

H_{02}: There will be no significant difference between the mean pre-test and post-test knowledge scores regarding breast cancer in selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in control group.

H_{03}: There will be no significant difference in the mean post-test knowledge score among experimental and control group students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh.

H_{04}: There will be no significant association between the mean post-test knowledge score regarding breast cancer with their selected socio-demographic variables in selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group and control group.

Delimitations

- The study is limited to the Govt. Sr. Sec. Schools.
- Students will be limited to 80 samples.
- Study focuses only students studied in 11th and 12th class.
- Period of data collection was limited to 2 weeks.

5. Methods and Approaches

Materials

Tool used was a self-structured knowledge questionnaire consisting of two sections. Section A 11 items of demographic variables and Section B consisted of 40 multiple-choice questions regarding breast cancer. The level of knowledge was categorized as good (66.7%-100%), average (33.4%-66.6%) and poor (>33.3%). The tools were developed after the review of literature from the various sources like textbook, journals, magazines and discussion with the experts in the field of medical and nursing department.

Methods

Research approach and design:

The study was conducted using a quantitative research approach with quasi-experimental pre-test post-test non-randomized control group design.

Variables

Independent variable was structured teaching programme regarding breast cancer and the dependent variable was knowledge regarding breast cancer among students.

Setting of study:
The study was conducted in Government Senior Secondary Schools of District Solan Himachal Pradesh.

Population:
The population of study was students from class 11th and 12th at selected Govt.Sr. Sec. Schools Tehsil Baddi, District Solan, Himachal Pradesh.

Sampling technique:
The sampling technique selected for the study was non-probability convenience sampling technique.

Sample:
The total sample size was 80 students out of which 40 students were selected for experimental group and 40 students for the control group. In present study the sample size was determined by using Yamane formula.

Inclusion criteria:
- Students who are willing to participate
- Students who are present at the time of data collection.
- Students from class 11th and 12th

Exclusion criteria:
- Students who are not available at the time of data collection
- Students who are not willing to participate.
- Boys are excluded from the study.
- Private schools were excluded from the study.

6. Result

Section I: Findings related to description of socio-demographic variable of students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental and control group.

Table 1: Frequency and percentage distribution of students according to their socio-demographic variables in both experimental and control group., n=80(EG=40+CG=40)

Socio-demographic variables		Experimental group		Control group	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Age (in years)	16 years	15	37.5	24	60
	17 years	21	52.5	13	32.5
	18 years	4	10	3	7.5
	Above 18 years	0	0	0	0
Education standard	11th	20	50	20	50
	12th	20	50	20	50
Stream	Medical	10	25	10	25
	Non-medical	10	25	10	25
	Commerce	10	25	10	25
	Arts	10	25	10	25
Area of residence	Rural area	17	42.5	29	72.5
	Urban area	23	57.5	11	27.5
	Semi-urban	0	0	0	0
Type of family	Nuclear family	21	52.5	15	37.5
	Extended family	6	15	2	5
	Joint family	13	32.5	23	57.5
Religion	Hindu	38	95	37	92.5
	Muslim	2	5	1	2.5
	Sikh	0	0	2	5
	Christian	0	0	0	0
	Others	0	0	0	0
Qualification of father	No formal education	0	0	0	0
	Primary education	12	30	10	25
	Secondary education	16	40	18	45
	Senior-secondary education	11	27.5	12	30
	Graduation and above	1	2.5	0	0
Qualification of mother	No formal education	0	0	1	2.5
	Primary education	17	42.5	18	45
	Secondary education	14	35	14	35
	Senior-secondary education	8	20	5	12.5
	Graduation and above	1	2.5	2	5
Family income/month	≤Rs 10,000	1	2.5	2	5
	Rs 10,001-20,000	24	60	28	70
	Rs 20,001-30,000	14	35	10	25
	≥ Rs 30,001	1	2.5	0	0
Any history of breast cancer in family	Yes	0	0	2	5
	No	40	100	38	95
Any source of information regarding breast cancer	Family and friends	2	5	5	12.5
	Health personnel	2	5	1	2.5
	Mass media, Newspaper, Radio, TV	19	47.5	29	72.5
	No information	17	42.5	5	12.5

Table No:1: Describes distribution of students according to their selected socio-demographic variables that are: age, education standard, stream, area of residence, religion, qualification of father, qualification of mother, family income/month, any history of breast cancer in family, any source of information regarding breast cancer.

The study results showed that students belong to the age group from 16 to 18 years. In the experimental group, majority of students 21 (52.5%) were in the age group of 17 years, 15 (37.5%) students were in the age group of 16 years and 4 (10%) students were in age group of 18 years. In the control group most of the students 24 (60%) were in the age group of 16 years, followed by 17 years 13 (32.5%) and 18 years 3 (7.5%). No student belongs to the age group of above 18 years in both groups.

In the experimental group, 20 (50%) students were studying in 11th standard and 20 (50%) were in 12th standard. Similarly, in control group 20 (50%) students were studying in 11th standard and 20 (50%) were in 12th standard.

In terms of educational stream (Medical, Non-medical, Commerce and Arts) the students were equal distributed among both groups. Each stream had 5 (25%) students in both groups.

In experimental group the majority of students belong to urban areas 23 (57.5%) and 17 (42.5%) students belong to rural areas. Whereas in control group maximum 29 (72.5%) of students were belong to rural areas whereas 11 (27.5%) belong to urban areas. No students belonged to semi-urban area in both groups.

In experimental group most of students belongs to nuclear family 21 (52.5%), 13 (32.5%) belongs to joint family and 6 (15%) belongs to extended family. Whereas in control group, majority 23 (57.5%) of students belongs to joint family, 15 (37.5%) belongs to nuclear family and 2 (5%) belongs to extended family.

In experimental group maximum of students 38 (95%) were Hindu while 2 (5%) students were Muslim. Whereas in control group 37 (92.5%) students were Hindu, 2 (5%) were Sikh and only 1 (2.5%) were Muslim.

In experimental group, 16 (40%) fathers had secondary education, 12 (30%) had primary education, 11 (27.5%) had senior secondary education and 1 (2.5%) father's educational status was upto graduate and above. Whereas in control group, most fathers 18 (45%) had secondary education, 12 (30%) had senior secondary education and 10 (25%) had primary education. And none of father's education lies in no formal education category in both groups.

In experimental group, 17 (42.5%) mothers had primary education, 14 (35%) had secondary education, 8 (20%) had senior secondary education and 1 (2.5%) mother's education status was upto graduate and above and none of mother's educational status found with no formal education. Whereas in control group 18 (45%) mother's education status was upto primary education, 14 (35%) had secondary education, 5 (12.5%) had senior secondary education, 2 (5%) had graduate and above and 1 (2.5%) had no formal education.

In experimental group, the majority 24 (60%) students had monthly family income of Rs. 10,001–20,000, 14 (35%) student's monthly family income was Rs. 20,001-30,000 and 1 (2.5%) students had family income ≥ Rs 30,001 and 1 (2.5%) ≤Rs 10,000. Whereas in control group maximum 28 (70%) students had monthly family income was Rs. 10,001–20,000, 10 (25%) had monthly family income Rs. 20,001-30,000 and 2 (5%) had monthly family income ≤Rs 10,000.

In experimental group, none of the students reported a family history of breast cancer in the family. Whereas in control group 2 (5%) students had a history of breast cancer in the family.

In experimental group, maximum 19 (47.5%) of students received information regarding breast cancer through mass media, Newspaper, radio and TV, while 17 (42.5%) had no prior information, 2 (5%) students obtained information from health personnel and 2 (5%) from family and friends. In control group the majority of students 29 (72.5%) had received information through mass media, Newspaper, radio and TV, 5 (12.5%) from family and friends, 5 (12.5%) had no information and 1 (2.5%) obtained information from health personnel.

Section II: Findings related to the pre-test knowledge score regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental and control group.

Table 2: Frequency and percentage distribution of pre-test knowledge score of students regarding breast cancer in both experimental and control group, n=80(EG=40+CG=40)

Criteria Measure of Pre-Test Knowledge Score					
Category	Scoring level	Experimental Group		Control Group	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Below average	0-13	4	10%	14	35%
Average	14-26	36	90%	26	65%
Good	27-40	0	0%	0	0%

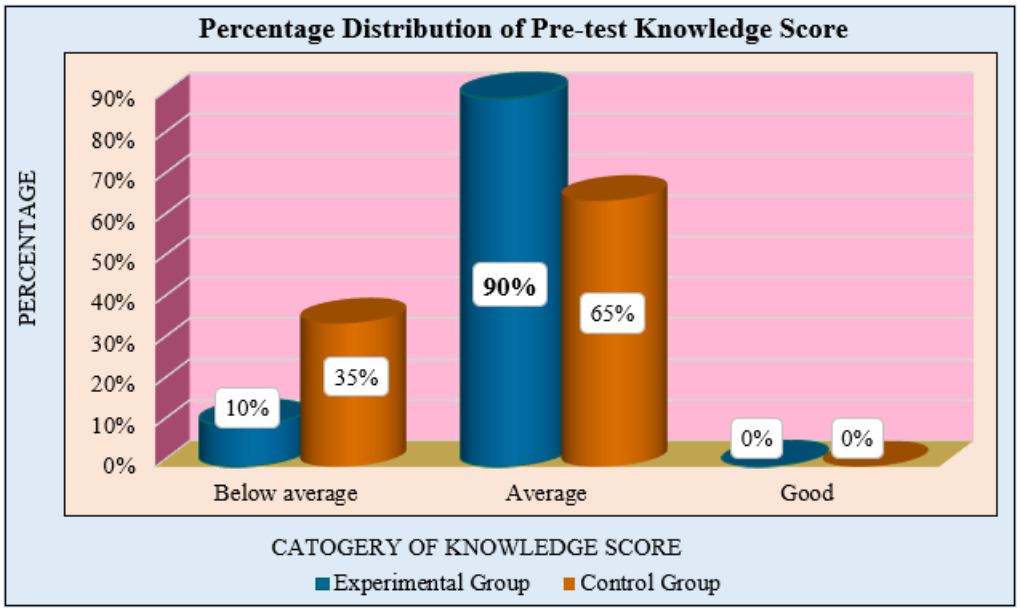

Figure 1: Showing percentage distribution of pre-test knowledge score among students in experimental and control group.

Table 2 and Fig No. 1: Depicts that in experimental group, 36 (90%) students had average knowledge and 4 (10%) students had below average knowledge during pre-test. Whereas, in control group 26 (65%) students had average and 14 (35%) had below average knowledge during pre-test. Among both group there is no students who have good knowledge regarding breast cancer during pre-test.

Section-III: Findings related the post-test knowledge score regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental and control group.

Table 2: Comparison of mean, standard deviation and mean percentage of pre-test knowledge score among students in experimental group and control group, n=80(EG=40+CG=40)

Descriptive statistics	Mean	SD	Median Score	Maximum	Minimum	Range	Mean %
Experimental Group	15.68	1.9	16	19	12	7	39.2
Control Group	14.98	2.41	16	19	9	10	37.45

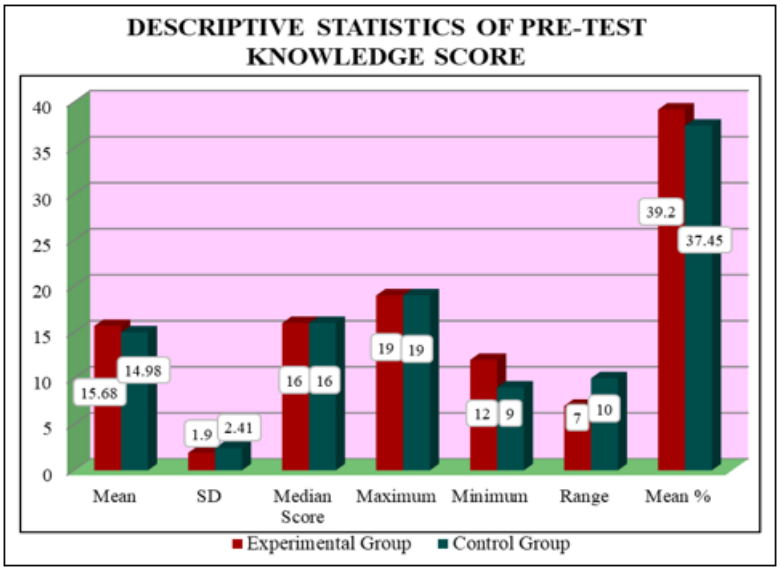

Figure 2: Group wise comparison of descriptive statistics of pre-test knowledge score

Table:3 and Fig no: 2: Delineate the mean, standard deviation and mean percentage of pre-test knowledge regarding breast cancer among students in experimental and control group. The analysis disclose that mean score is 15.68±1.9 which is 39.2% of total mean percentage score in experimental group. Whereas in control group the analysis revealed that mean score 14.98±2.41 which is 37.45% of total mean percentage score.

Section-III: Findings related the post-test knowledge score regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental and control group.

Table 4: Frequency and percentage distribution of post-test knowledge score of students regarding breast cancer in both experimental and control group, n=80(EG=40+CG=40)

Criteria Measure of Post-Test Knowledge Score					
Category	Scoring level	Experimental Group		Control Group	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Below average	0-13	0	0	8	20
Average	14-26	2	5	32	80
Good	27-40	38	95	0	0

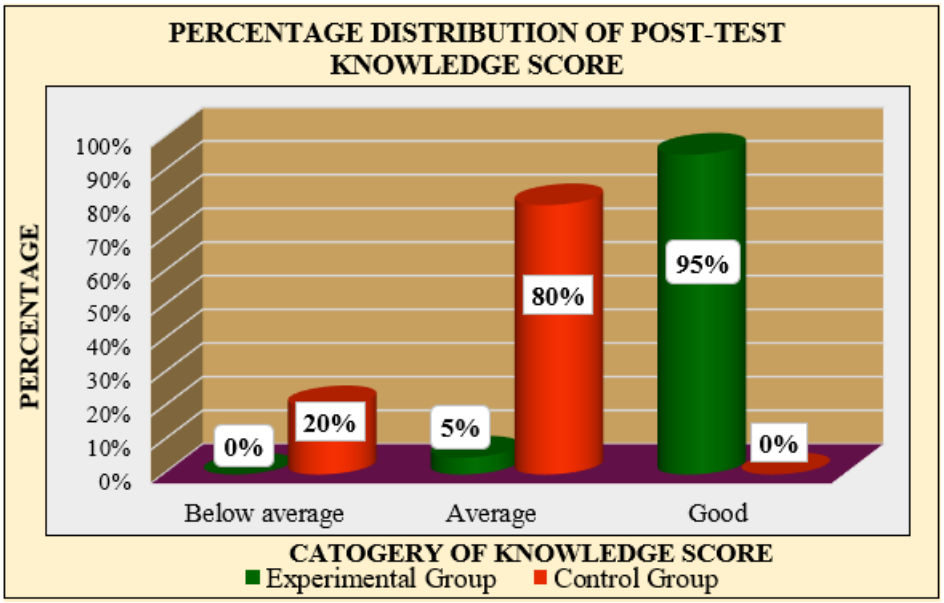

Figure 3: Showing percentage distribution of post-test knowledge score regarding breast cancer among students in experimental group and control group

Table: 4 and Figure 3: Reveals that in experimental group, 38 (95%) students had good knowledge and 2 (5%) had average knowledge regarding breast cancer but none of student scored below average during post-test. Whereas in control group, 32 (80%) students had average knowledge and 8 (20%) had below average knowledge regarding breast cancer but none of student scored good in post-test.

Table 5: Comparison of mean, standard deviation and mean percentage of post-test knowledge score regarding breast cancer among students in experimental and control group.

Post-Test Knowledge Score, n=80(EG=40+CG=40)

Descriptive statistics	Mean	SD	Median Score	Maximum	Minimum	Range	Mean %
Experimental Group	32.7	2.83	32.5	37	26	11	81.75
Control Group	15.18	1.88	15	19	11	8	37.95

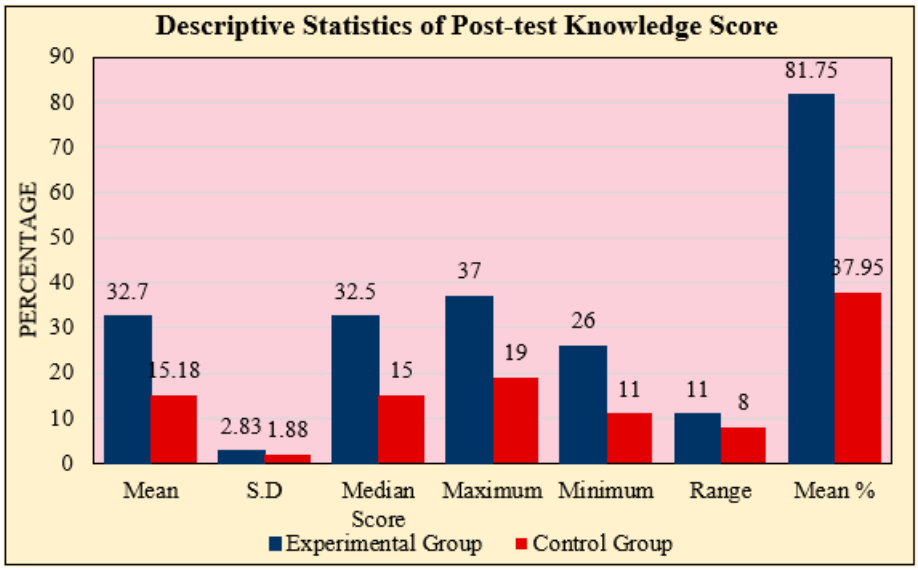

Figure 4: Descriptive statistics for post-test knowledge regarding breast cancer among students in experimental and control group.

Table: 5 and Figure No: 4: Describe the mean, standard deviation and mean percentage of post-test level of knowledge regarding breast cancer among students in experimental and control group. The analysis disclose that mean score is 32.7±2.83 which is 81.75% of total mean percentage score in experimental group. Whereas in control group the analysis revealed that mean score 15.18±1.88 which is 37.95% of total mean percentage score.

Section-IV: Findings related to evaluating the effectiveness of structured teaching programme on knowledge regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group.

Table 6: Comparison of mean, standard deviation, mean percentage, mean percentage difference between the pre-test and post-test knowledge score of students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group and control group, n=80(EG=40+CG=40)

Groups	Pre-Test			Post-Test			
	Mean	SD	Mean %	Mean	SD	Mean %	Mean Percentage difference %
Experimental Group	15.68	1.9	39.2	32.7	2.83	81.75	42.55
Control Group	14.98	2.41	37.45	15.18	1.88	37.95	0.5

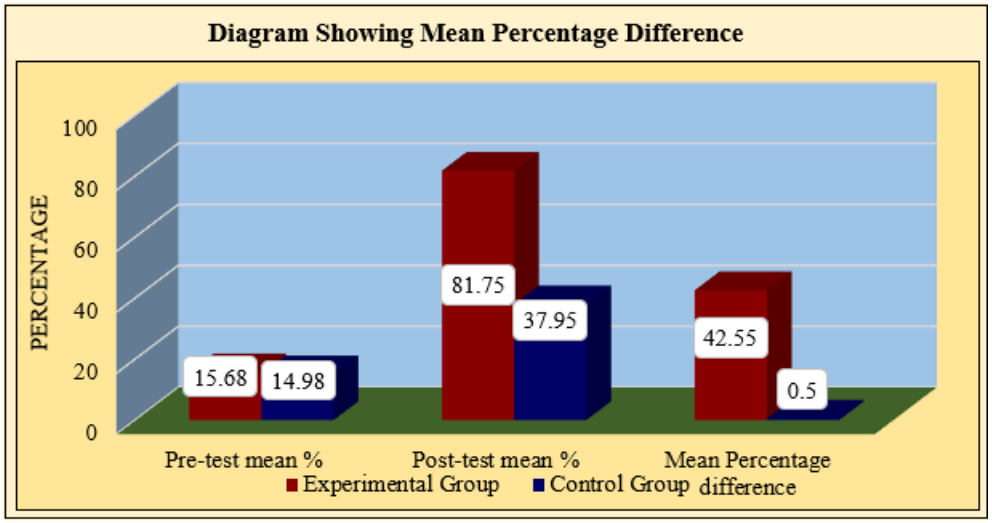

Figure 5: Diagram showing the pre-test and post-test knowledge score and mean percentage difference among students in experimental group and control group

Table 6 and Figure No: 5- In experimental group, the pre-test mean score was 15.68±1.9 which was 39.2% of total mean score percentage and in post-test mean score was 32.7±15.18 which was 81.75% of total mean score percentage. The difference in pre-test and post-test mean score was 42.55%. In control group, the pre-test mean score was 14.98±2.41 which was 37.45% of total mean score percentage and in post-test mean score was 15.18±1.88 which was 0.5% of total mean score percentage. The difference in pre-test and post-test mean score was 0.5%.

Section V: This section consists of:

- No significance difference between pre-test and post-test knowledge score regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental and control group.
- No association between post-test knowledge score regarding breast cancer with their selected socio-demographic variables among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group and control group.

Table 7: Comparison of mean score, standard deviation, mean difference, paired t-test and p value between the pre-test and post-test knowledge score of students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group

Experimental Group, n=40

Experimental group	Mean	SD	Mean Difference	df	Paired 't' test	Table value at 0.05	p-value	Result
Pre-test	15.68	1.9	17.02	39	35.59	2.04	<0.001	Significant
Post-test	32.7	2.83						

Table 7: Describes that paired 't' test was analyzed the difference between pre-test and post-test knowledge score regarding breast cancer among students in experimental group. The mean score and S.D was 15.68±1.9 in pre-test and 32.7±2.83 in post-test. The calculated paired 't' test value is 35.59 which is higher than the table value 2.04. This shows that there is significant mean difference of 17.02 between pre-test and post-test in experimental group. Hence the null hypothesis H01 is rejected ($p<0.001$). It is interpreted that the difference observed in the mean knowledge score values of pre-test and post-test were true difference not by chance.

Table 8: Comparison of mean score, standard deviation, mean difference, paired t-test and p value between the pre-test and post-test knowledge scores among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in control group.

Control Group, n=40

Control Group	Mean	S.D.	Mean Difference	df	Paired 't' test	Table value at 0.05	p-value	Result
Pre-test	14.98	2.41	0.2	39	0.576	2.04	0.568	Non-Significant
Post-test	15.18	1.88						

Table 8: Depicts that paired 't' test was calculated to analyze the difference between pre-test and post-test knowledge score regarding breast cancer among students in control group. The mean score and S.D was 14.98±2.41 in pre-test and 15.18±1.88 in post-test. The calculated paired 't' test value is 0.576 which is lesser than the table value 2.04, this shows that there is no significant difference between pre-test and post-test knowledge score in control group.

Hence, the hypothesis H02 is accepted (p=0.568).

Table 9: Comparison of mean score, standard deviation, mean difference, unpaired t-test and p value between the pre-test and post-test knowledge score among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group and control group, n=80(EG=40+CG=40)

Post-Test Knowledge Score

Groups	n	Mean	S.D.	Mean %	Difference in mean %	df	Unpaired t-test	t-value	p-value
Experimental Group	40	32.7	2.83	81.75	43.8%	78	32.623	2.00	<0.001 Significant
Control Group	40	15.18	1.88	37.95					

Table: 9: Detailed that unpaired 't' test was calculated to analyze the difference between post-test knowledge score among students in experimental and control group. During the post-test the mean score and S.D was 32.7± 2.83 in experimental group and the mean score and S.D. was 15.18±1.88 in control group. The calculated unpaired 't' value was 32.623 which is higher than table value i.e.2.00 in post-test. This shows that there is significance mean percentage difference i.e. 43.8% between post-test knowledge scores in experimental and control group respectively. Hence the null hypothesis H_{03} is rejected (p<0.001).

Table 10: Association between post-test knowledge score with their selected demographic variables in experimental group, n=40(EG)

Demographic Variables		Association of post-test knowledge score with their selected demographic variables in experimental group							
Variables	Options	Good	Average	Below average	Chi Test	P Value	df	Table Value	Result
Age (in years)	16 years	15	0	-	4.160	0.125	2	5.991	Not Significant
	17 years	20	1	-					
	18 years	3	1	-					
	Above 18 years	0	0	-					
Educational Standard	11th	20	0	-	2.105	0.147	1	3.841	Not Significant
	12th	18	2	-					
Stream	Medical	10	0	-	6.316	0.097	3	7.815	Not Significant
	Non-medical	10	0	-					
	Commerce	10	0	-					
	Arts	8	2	-					
Area of residence	Rural area	23	0	-	9.47	0.002	1	3.841	Significant
	Urban area	10	7	-					
	Semi-urban	0	0	-					
Type of family	Nuclear family	21	0	-	4.372	0.112	2	5.991	Not Significant
	Extended family	6	0	-					
	Joint family	11	2	-					
Religion	Hindu	36	2	-	0.111	0.739	1	3.841	Not Significant
	Muslim	2	0	-					
	Sikh	0	0	-					
	Christian	0	0	-					
	Others	0	0	-					
Qualification of father	No formal education	0	0	-	3.158	0.368	3	7.815	Not Significant
	Primary education	12	0	-					
	Secondary education	14	2	-					
	Senior-secondary education	11	0	-					
	Graduate and above	1	0	-					
Qualification of mother	No formal education	0	0	-	2.848	0.416	3	7.815	Not Significant
	Primary education	15	2	-					
	Secondary education	14	0	-					

	Senior-secondary education	8	0	-					
	Graduate and above	1	0	-					
Family income/ month	≤Rs 10,000	1	0	-	0.276	0.965	3	7.815	Not Significant
	Rs 10,001-20,000	23	1	-					
	Rs 20,001-30,000	13	1	-					
	≥ Rs 30,001	1	0	-					
Any history of breast cancer in family	Yes	0	0	-	NA	NA	NA	NA	NA
	No	38	2	-					
Any source of information regarding breast cancer	Family and friends	2	0	-	2.848	0.416	3	7.815	Not Significant
	Health personnel	2	0	-					
	Mass media, Newspaper, Radio, TV	19	0	-					
	No information	15	2	-					

Table No.10: Describes that in experimental group there is no significant association was found for the socio-demographic variables such as age, education standard, stream, type of family, religion, education of father, education of mother, family income, any history of breast cancer in family, any source of information regarding breast cancer. The calculated chi square value was more than table value at 0.05 level of significance. Hence the null hypothesis H_{04} is accepted for above stated variables. There is significant association was found in the variable area of residence. The calculated chi square value was less than table value at 0.05 level of significance. Hence the null hypothesis H_{04} was rejected for this variable.

Table 4.11: Association between post-test knowledge score with their selected demographic variables in control group, n=40(CG)

Demographic Variables		Association of post-test knowledge score with their selected demographic variables in control group							
Variables	Options	Good	Average	Below average	Chi Test	P Value	df	Table Value	Result
Age (in years)	16 years	-	15	9	0.837	0.658	2	5.991	Not Significant
	17 years	-	8	5					
	18 years	-	3	0					
	Above 18 years	-	0	0					
Educational Standard	11th	-	13	7	0.625	0.429	1	3.841	Not Significant
	12th	-	13	7					
Stream	Medical	-	7	3	5.000	0.172	3	7.815	Not Significant
	Non-medical	-	5	5					
	Commerce	-	6	4					
	Arts	-	8	2					
Area of residence	Rural area	-	18	11	0.031	0.859	1	3.841	Not Significant
	Urban area	-	8	3					
	Semi-urban	-	0	0					
Type of Family	Nuclear family	-	10	5	3.324	0.190	2	5.991	Not Significant
	Extended family	-	0	2					
	Joint family	-	16	7					
Religion	Hindu	-	23	14	0.811	0.667	2	5.991	Not Significant
	Muslim	-	1	0					
	Sikh	-	2	0					
	Christian	-	0	0					
	Others	-	0	0					
Qualification of father	No formal education	-	0	0	1.701	0.427	2	5.991	Not Significant
	Primary education	-	5	5					
	Secondary education	-	12	6					
	Senior-secondary education	-	9	3					
	Graduate and above	-	0	0					
Qualification of mother	No formal education	-	1	0	2.698	0.609	4	9.488	Not Significant
	Primary education	-	11	7					
	Secondary education	-	10	4					
	Senior-secondary education	-	2	3					
	Graduate and above	-	2	0					
Family income/ month	≤Rs 10,000	-	1	1	1.205	0.547	2	5.991	Not Significant
	Rs 10,001-20,000	-	16	12					
	Rs 20,001-30,000	-	9	1					
	≥ Rs 30,001	-	0	0					
Any history of breast cancer in family	Yes	-	1	1	0.526	0.468	1	3.841	Not Significant
	No	-	25	13					
	Family and friends	-	3	2	4.138	0.247	3	7.815	Not Significant

Any source of information regarding breast cancer	Health personnel	-	0	1					
	Mass media, Newspaper, Radio, TV	-	18	11					
	No information	-	5	0					

Table 4.11: Depicts that in control group there is no significant association found for the socio- demographic variables such as age, education standard, stream, area of residence, type of family, religion, education of father, education of mother, family income, any history of breast cancer in family, any source of information regarding breast cancer. The calculated chi square value was less than table value at .0.05 level of significance. Hence, the null hypothesis H_{04} i.e. There will be no significant association between the post-test knowledge score regarding breast cancer in control group with their selected socio-demographic variables is accepted.

7. Discussion

The first objective of the study was to assess the pre-test knowledge score regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental and control group. In present study, the pre-test knowledge score revealed that 36 (90%) students had average knowledge while 4 (10%) students had below average knowledge in experimental group. Whereas, in control group 26 (65%) students had average and 14 (35%) had below average knowledge during pre-test. Among both group there is no students who have good knowledge regarding breast cancer in pre-test. This objective is supported by study conducted by **Jenitha T (2025),** which reported that the majority 30 (60%) had inadequate knowledge, 16 (32%) had moderate knowledge and 4 (8%) had adequate knowledge regarding breast cancer during pre-test. Both studies indicate that there was moderate knowledge regarding breast cancer in pre-test.[7]

The second objective of the study was to assess the post-test knowledge score regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group and control group. In present study, majority of students in experimental group 38 (95%) had good knowledge while 2 (5%) had average knowledge, none of student scored below average during post-test regarding breast cancer in post-test. In control group, 32(80%) students had average knowledge and 8 (20%) had below average, none of student scored good knowledge score regarding breast cancer during post-test. This objective was supported by **Manisha Dcosta (2026),** conducted a which shows that, in experimental group 13 (65%) had excellent knowledge and 7 (35%) had good knowledge score. In control group, 7 (35%) had poor knowledge 11 (55%) had average knowledge and 2 (10%) had good knowledge in post-test. The findings of both studies indicates that improvement in knowledge score after administration of structured teaching programme.[8]

The third objective of the study was to assess the effectiveness of structured teaching programme on knowledge regarding breast cancer among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group. The present study shows that, the pre-test mean score was 15.68±1.9 and post-test mean score was 32.7±2.83. The calculated t value was 35.59 which shows significant difference in pre-test and post-test scores. This objective is supported by the study conducted by **Adarsha Kumari, Shinod R.T (2026),** which shows that the pre-test mean score was 23.3±6.38 and in post-test mean score was 50.2±3.79. The calculated t value was 27.46 which shows statistically significant difference in pre-test and post-test scores. The findings of both studies showed that structured teaching programme was effective in improving the knowledge regarding breast cancer.[9]

The fourth objective of the study was to determine the association between post- association between post-test knowledge score regarding breast cancer with their selected socio-demographic variables among students of selected Govt. Sr. Sec. Schools of District Solan, Himachal Pradesh in experimental group and control group. The present study reveals that, in experimental group there is no significant association was found for the socio-demographic variables such as age, education standard, stream, type of family, religion, education of father, education of mother, family income, any history of breast cancer in family, any source of information regarding breast cancer, but there is significant association between the post-test knowledge score with their selected demographic variable i.e. area of residence. Whereas in control group there is no significant association found for the socio- demographic variables such as age, education standard, stream, type of family, religion, education of father, education of mother, family income, any history of breast cancer in family, any source of information regarding breast cancer. This objective is supported by the study conducted by **Mohammed- Azri-Al (2023)** which shows that there is no significant association found in both groups with their selected demographic variables such as age, health issues, family members with cancer, degree of relative with cancer, how you ever undergone a breast examination, have you heard about breast self-examination, how often you check your breast, have you seen a doctor about changes in your breast.[10]

8. Conclusion

In the present study, the mean pre-test knowledge score is 15.68±1.9 which is 39.2 % of total mean percentage and whereas in post-test knowledge score is 32.7±2.83 which is 81.75 % of total mean percentage score in experimental group and whereas in control group the mean pre-test score is 14.98±2.41 which is 37.45% of total mean percentage and the mean post-test score 15.18±1.88 which is 37.95% of total mean percentage score. The results show the significant improvement in knowledge score after administration of structured teaching programme among students in experimental group only which signifies the effectiveness of structured teaching program.

9. Nursing Implication

The present study has several implications for nursing practice, nursing education, nursing administration and nursing research.

Nursing Education:

- Breast cancer prevention and awareness programmes should be initiated in nursing curriculum and school health educational programmes.
- As an educator trained nursing students regarding effective teaching strategies for conducting health education programme in schools and community settings.
- Continuing educational programmes can help nurses to update their knowledge regarding breast cancer.
- As an educator organize seminar, workshop, role-plays on breast cancer awareness.
- Proper use of teaching material such as charts, flashcards, pamphlets, videos etc. to improve understanding of breast-self-examination in colleges, schools and community.

Nursing Practice

- Community health nurses can organize regular health education programme in schools and community to improve awareness regarding breast cancer.
- Nurses can educate student nurses and adolescents about warning signs and the importance of breast self-examination in early detection of breast cancer.
- Nurses can encourage the females to adopt healthy lifestyle practices that can promotes the positive health behaviour.
- By providing educational material clinical instructors and nurse can contribute toward enhance learning of women and adolescence girls.

Nursing Research

- The findings of present study provide baseline data for future research on breast cancer awareness among adolescents.
- This study encourages the beginners to conduct this study on larger population by using different tools.
- Encourages to disseminate the knowledge by publications and organize journal club presentations, conferences etc.
- Further researches can be conducted on this topic that can explore the relationship between knowledge, attitudes and preventive practices regarding breast cancer among adolescents and young women.

Nursing Administration

- Nurse administrator can formulate policies that includes regular cancer awareness programmes and health camps in hospital, school and community settings.
- Nurse administrator can provide adequate resources, teaching aids, trained staff for conducting health camps and educational programmes.
- Nurse administrator can make collaboration between health departments and educational institutes to promote and create awareness among adolescence.
- Nurse administrator can organize workshops, seminars for nurses on breast cancer prevention and health promotion strategies.

10. Limitations

- The present study was limited in Govt. Schools. of District Solan, Himachal Pradesh. Hence the result cannot be generalized to all students.
- The present study assessed only knowledge regarding breast cancer but did not look into assess change, attitude and practice.
- The knowledge of participants was measured using a self-structured knowledge questionnaire and the responses depend on the understanding of participants.
- The sample size was limited which affects the generalizability.
- Data collection procedure was done within shorter duration.

11. Recommendations

Recommendations are based on the findings of the study that are offered for future research.

- A similar study can be conducted on larger sample in different settings to generalize the study findings.
- A comparative study can be conducted to evaluate the effectiveness of different teaching aids for breast cancer awareness.
- Similar research study can be conducting on attitude and practice regarding breast cancer and breast self-examination.
- Different attitude scales and tools can be used on conducting similar study.
- Similar study can be conducted at clinical areas with the objective to assess the practice of breast self-examination among nurses.
- A similar study can be conducted for a longer duration of time to achieve more effective results.

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Authors Contribution

Vandana Chandel: Introduction, Conceptualization, methodology, investigation, data curation, format analysis, validation, visualization, writing of original draft and critical review and editing.

Dr. Raghunandan Singh: Supervision, project administration and critical review and editing.

Ms. Nitika Sharma: Supervision and critical review and editing.

All authors contributed to the interpretation of the findings, critically reviewed the manuscript, approved the final version of publication and agreed to be accountable for all aspects of the work, including ensuring that any concern regarding accuracy or integrity of the research are appropriately investigated and resolved.

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