ORIGINAL ARTICLE

A Study to Assess the Effectiveness of Self Instructional Module (SIM) on Knowledge and Attitude Regarding Breast Cancer Among Late Adolescents Studying in Selected Degree Colleges at Dharwad, Karnataka

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Abstract

Background: Breast cancer is the leading cause of cancer in women. The knowledge and attitude of breast cancer is poor among adolescents. The present study aimed to assess the knowledge and attitude among late adolescents on breast cancer, to develop self-instruction module and to determine effectiveness of self-instruction module in improving the knowledge and attitude.

Methods: A evaluatory approach using one group pre-test post-test design was adopted. A sample of 335 adolescents was selected using purposive sampling technique from the selected degree colleges of Dharwad. The designed tool showed content validity index of 0.89, reliability of knowledge 0.90 and attitude 0.88. The pretest was conducted to assess the knowledge and attitude among late adolescents regarding breast cancer using a designed tool, following which self-instruction module was administered. Following this, post-test was conducted after thirty days using the same designed tool and the data was collected in the form of scores. The obtained scores were tabulated, and computed using SPSS 20.0 version software for statistic analysis.

Results: The study found that mean pretest knowledge and attitude scores were less than mean post-test knowledge and attitude scores and mean% enhancement in knowledge and attitude was 41.46% and 47.25%, respectively. The study revealed the effectiveness of the self-instruction module on knowledge and attitude scores to be 33.54 and 29.95 for 334 degrees of freedom with $P < 0.001$. The knowledge and attitude levels improved to adequate knowledge and good attitude towards breast cancer. Further the study found significant association between all the socio-demographic variables except age, and found no significant correlation between pretest knowledge and attitude scores.

Conclusion: The study found that the self-instruction module was effective in improving the knowledge and attitude, and found significant association of pretest knowledge and attitude scores with selected demographic variables. The study concluded that the self-instruction module can bring significant awareness among population and recommended that more evidenced based research must be conducted to bring awareness about breast cancer among large groups.

Keywords: Breast cancer, Late adolescents, Self-instruction module, Knowledge, Attitude

Introduction

Non communicable diseases such as cancer are assuming increasing importance among the adult population in both developed and developing countries. The impact of cancer on people is serious when measured in terms of loss of lives, disablement, poverty and economic loss to the country. In 2020, 2.3 million new cases of breast cancer and 6,85,000 deaths were reported worldwide. Breast cancer is the most common cancer in the world as of the end of 2020, with 7.8 million women alive who had been diagnosed in the previous five years. Women lose more disability-adjusted life years (DALYs) to breast cancer than any other type of cancer worldwide. Breast cancer affects women of all ages after puberty in every country around the world, with rising rates in later life.[1] Breast cancer is the most common female cancer worldwide representing nearly a quarter (23%) of all cancers in women. Nearly 0.5-1% of breast cancers occur in men. The global burden of breast cancer is expected to cross two million by the year 2030, with growing proportions from developing countries. According to research, about 1 in 8 women will develop invasive breast cancer, and 2,650 new cases of invasive male breast cancer are expected this year, according to BreastCancer.org.[2] It is very important to create awareness among adolescents regarding breast cancer to prevent and manage breast cancer at the earliest. Hence the present study was framed to assess and educate the late adolescents about breast cancer using self-instruction module.

Materials and Methods

An quantitative approach was selected for the study. The sample included 335 late adolescents studying in selected degree colleges. Non probability purposive sampling technique was used, and a structured knowledge and attitude questionnaire consisting of socio-demographic details and 38 knowledge based multiple choice questions and 15 attitude based questions was administered. For knowledge based questions, every correct answer was given a score of one and for incorrect answer, a score of zero was given. The maximum score for the knowledge based questions was 38 and minimum score was zero, and for assessing attitude, five point Likert scale questionnaire was designed having a maximum score of 75 and a minimum score of 15. The tool validated by the subject experts from Oncology, Community Medicine, Community Nursing and a Statistician found a content validity

index of 0.89, the calculated reliability using test retest method for knowledge questionnaire was found to be 0.90 and reliability for attitude calculated by split half method was 0.88. The researcher obtained permission from the ethical authority of selected degree colleges, conducted a pre-test to assess knowledge and attitude among late adolescents following which self-instructional module was administered. After completion of 30 days, post test was conducted among late adolescents using the same knowledge and attitude questionnaire. The collected data was statistically analyzed for the effectiveness of self-instructional module.

Results

The present study aimed to assess the effectiveness of self-instructional module in improving knowledge and attitude regarding breast cancer among late adolescents.

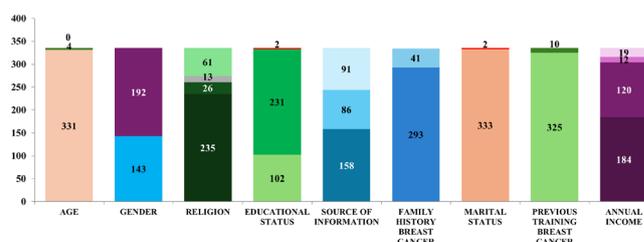### Findings related to the socio-demographic variables

Figure 1: Multi-bar diagram depicting the distribution of socio-demographic variables

In the present study, out of 335 late adolescents, 331 (98.80%) were in the age group of 18 to 20 years, four (1.20%) were in the age group of 21 to 22 years. It was observed that out of 335 late adolescents, 143 (42.70%) were males, 192 (57.30%) were females. 235 (70.10%) late adolescents were Hindus, 26 (7.80%) were Muslims, 13 (3.90%) were Christians and 61 (18.20%) included Jains, Parsis, Sikhs. 102 (30.40%) participants stated pre-university as their education qualification, 231 (69.00%) were undergraduates and two (0.60%) of the late adolescents were postgraduates. As the sample included degree students, most of the participants were undergraduates. 158 (47.20%) of late adolescents stated to have received information regarding breast cancer through mass media, 86 (25.70%) gained information through health professionals and 91 (27.20%) of late adolescents received information on breast cancer from friends and family members. 41 (12.20%) late adolescents had no family history of breast cancer (Figure 1).

It was noted that 333 (99.40%) late adolescents were unmarried while two (0.60%) late adolescents were married. It was observed that 325 (97.00%) late adolescents had no previous training on breast cancer while 10 (3.00%) late adolescents received previous training on breast cancer two years ago. For annual family income, 184 (54.90%) late adolescents reported less than Rs. 100000/-, 120 (35.80%) reported an annual family income of Rs. 100001/- to Rs. 300000/-, 12 (3.60%) reported an annual family income of Rs. 300001/- to Rs. 500000/-, and 19 (5.70%) reported their family income to be more than Rs. 500001/- (Figure 1).

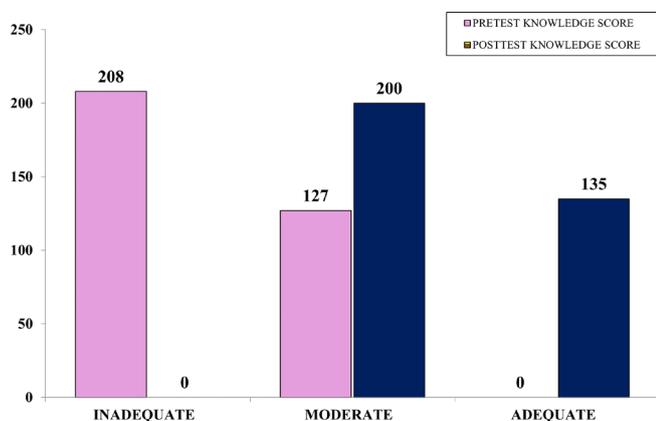**Findings related to levels of knowledge in pre-test and post-test**

Figure 2: Bar diagram depicting the levels of knowledge among adolescents in pre-and posttest

In the present study (Figure 2), in the pretest, 208 (62.08%) adolescents showed inadequate knowledge, 127 (37.92%) showed moderate knowledge while none demonstrated adequate knowledge regarding breast cancer.

The knowledge levels were found to have enhanced in the post-test with 135 (40.30%) late adolescents demonstrating adequate knowledge, 200 (59.70%) late adolescents showed moderate knowledge levels and none of the adolescents showed inadequate knowledge levels.

This signifies that the self-instruction module was effective in improving the knowledge levels of late adolescents regarding breast cancer.

Findings related to comparison of pre-test and post-test knowledge mean% scores
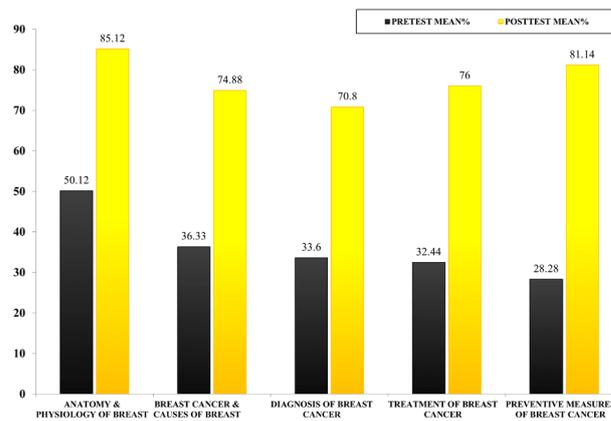

Figure 3: Bar diagram depicting the comparison of mean% pretest and posttest knowledge scores

In the present study (Figure 3), the comparison of pre-test and post-test scores showed significant difference in mean%. The mean% in post-test for all aspects was higher than the pretest. This implies that, the self-instruction module was effective in enhancing the knowledge levels of the late adolescents on breast cancer.

The mean% knowledge enhancement regarding anatomy and physiology of breast, breast cancer and causes of breast cancer, diagnosis of breast cancer, treatment of breast cancer, preventive measures of breast cancer was found to be 35.00, 38.55, 37.20, 43.55, 52.85, respectively.

Findings related to levels of attitude scores in pre-test and post-test
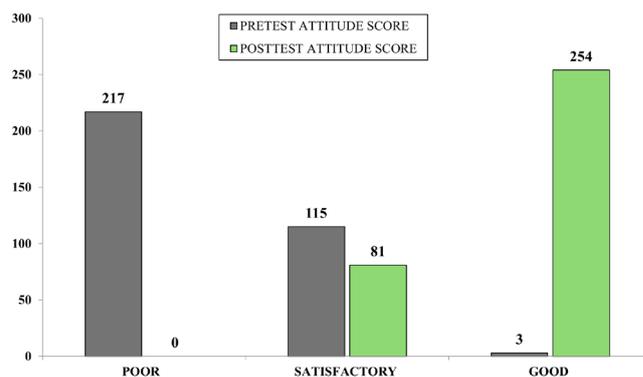
Figure 4: Bar diagram depicting the levels of attitude among adolescents in pre-and posttest

In the pre-test (Figure 4), 217 (64.77%) had poor attitude, 115 (34.32%) had satisfactory attitude and three (0.89%) had good attitude.

Post test this attitude levels improved to satisfactory attitude among 81 (24.17%) late adolescents, 254 (75.82%) late adolescents showed improvement to good attitude levels, while none of them demonstrated poor

attitude towards breast cancer in the post-test. This indicates that the self-instruction module was effective in improving the attitude levels among late adolescents regarding breast cancer.

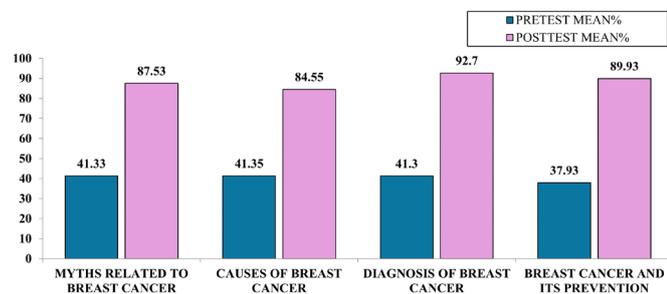**Findings related to comparison of pre-test and post-test attitude mean% scores**

Figure 5: Bar diagram depicting the comparison of mean% pretest and posttest attitude scores

In the present study (Figure 5), the comparison of the pre-test and post-test showed significant difference in mean and standard deviation. The mean% of post-test in all aspects was higher than the pretest. This implies that the self-instruction module had significant effect in improving the attitude levels among late adolescents regarding breast cancer.

The mean% attitude improvement in areas such as myths related to breast cancer, causes of breast cancer, diagnosis of breast cancer, breast cancer and its prevention was found to be 46.20, 43.20, 51.40, 52.00, respectively.

Findings related to effectiveness of self-instruction module on knowledge and attitude scores

In the present study (Table 1), it was observed that in knowledge aspect, the t value was 33.54 for 334 degrees of freedom with *P* value <0.001 and in attitude aspect, the t value was 29.95 for 334 degrees of freedom with *P* value <0.001, showing the significance of self-instruction module in improving the knowledge and attitude of late adolescents regarding breast cancer.

Findings related to association between pretest knowledge scores and socio-demographic variables

Table 1: Effectiveness of self-instruction module on knowledge and attitude scores

Late adolescents	Sample size		Mean	Standard deviation	T Value	df	*P* Value	Interference
Knowledge Scores	335	Pre Test	13.86	6.36	33.54	334	<0.001	Significant
		Post Test	29.61	3.94				
Attitude Scores	335	Pre Test	30.49	21.46	29.95	334	<0.001	Significant
		Post Test	65.93	6.52				

Table 2: Association between pre-test knowledge scores and socio-demographic variables

Demographic variables	Response categories	pre-test knowledge scores		χ^2	df	*P* Value	Interference
		Below median	**Above median**				
Age (years)	18 to 20	182	149	19.34	26	0.82	NS
	21 to 22	01	03				
Gender	Male	67	76	126.19	26	<0.001	S
	Female	116	76				
Religion	Hindu	113	122	345.92	78	<0.001	S
	Muslim/ Christian/ others	85	15				
Education qualification	Under Graduation	183	150	178.29	52	<0.001	S
	Post Graduation	1	1				

| Demographic variables | Response categories | pre-test knowledge scores | | χ^2 | df | *P* Value | Interference |
		Below median	Above median				
Source of information	Mass medias	87	71	291.19	52	<0.001	S
	Health personnel/ Friends or family members	110	67				
Family history of breast cancer	Yes	05	36	191.96	52	<0.001	S
	No	175	119				
Marital status	Married	01	01	93.47	26	<0.001	S
	Unmarried	196	137				
Previous training on breast cancer	Yes	00	10	224.59	26	<0.001	S
	No	197	128				
Family annual income	100000/- to 300000/-	161	143	237.69	78	<0.001	S
	300001/- to 500000/-	19	12				

NS-Not Significant; S-Significant; χ^2- Chi Square value; df- Degrees of freedom

In the present study (Table 2), selected demographic variables showed an association with pretest knowledge scores among late adolescents regarding breast cancer as described below.

Age: No significant association between age and pretest knowledge scores was observed among late adolescents ($\chi^2$2=19.34, df=26, *P*=0.82).

Gender: Association between gender and pretest knowledge scores among late adolescents was observed in the present study ($\chi^2$2= 126.19, df=26, *P*=0.0001).

Religion: An association between religion and pretest knowledge scores among late adolescents was observed ($\chi^2$2= 345.92, df=78, *P*=0.0001).

Educational qualification: In the present study, an association between educational qualifications and pretest knowledge scores among late adolescents was observed ($\chi^2$2= 178.29, df=78, *P*=0.0001).

Source of information: An association between sources of information and pretest knowledge scores among late

adolescents was found in the present study ($\chi^2$2= 291.19, df=52, *P*=0.0001).

Family history of breast cancer: In the present study, an association between family history of breast cancer and pretest knowledge scores was observed ($\chi^2$2= 191.96, df=52, *P*=0.0001).

Marital status: There was an association between marital status and pretest knowledge scores among late adolescents ($\chi^2$2= 93.47, df=26, *P*=0.0001).

Previous training on breast cancer: Previous training on breast cancer was found to be significantly associated with pretest knowledge scores among late adolescents ($\chi^2$2= 224.59, df=26, *P*=0.0001).

Family annual income: An association was found between family annual income and pretest knowledge scores among late adolescents ($\chi^2$2= 237.69, df=78, *P*=0.0001).

Findings related to pretest attitude scores and socio-demographic variables

Table 3: Association between pretest attitude scores and socio-demographic variables

| Demographic variables | Response categories | pre-test knowledge scores | | χ^2 | df | *P* Value | Interference |
		Below median	Above median				
Age (years)	18 to 20	89	242	48.29	42	0.23	NS
	21 to 22	02	02				
Gender	Male	55	88	119.77	42	<0.001	S
	Female	61	131				
Religion	Hindu	136	99	459.91	126	<0.001	S
	Muslim/ Christian/ others	42	58				
Education qualification	Under Graduation	193	140	301.88	84	<0.001	S
	Post Graduation	01	01				
Source of information	Mass medias	88	70	326.13	84	<0.001	S
	Health personnel/ Friends or family	106	71				
Family history of breast cancer	Yes	17	24	148.25	84	<0.001	S
	No	165	128				
Marital status	Married	01	01	168.36	42	<0.001	S
	Unmarried	193	140				
Previous training on breast cancer	Yes	02	08	124.39	42	<0.001	S
	No	192	133				
Family annual income	100000/- to 300000/-	169	135	328.18	126	<0.001	S
	300001/- to 500000/-	19	12				

NS-Not Significant; S-Significant; $\chi^2$2- Chi Square value; df- Degrees of freedom

In the present study, selected demographic variables showed association as follows with pretest attitude scores among late adolescents regarding breast cancer (Table 3).

Age: No significant association was found between age and pretest attitude scores among late adolescents ($\chi^2$2=48.29, df=42, *P*=0.23).

Gender: Gender was found to be significantly associated with pretest attitude scores among late adolescents ($\chi^2$2= 119.77, df=42, *P*=0.0001).

Religion: An association between religion and pretest attitude scores among late adolescents was observed in the present study ($\chi^2$2= 459.91, df=126, *P*=0.0001).

Educational qualification: In the present study, association between educational qualification and pretest attitude scores among late adolescents was observed ($\chi^2$2= 301.88, df=84, *P*=0.0001).

Source of information: A significant association between sources of information and pretest attitude scores was observed in the present study ($\chi^2$2= 326.13, df=84, *P*=0.0001).

Family history of breast cancer: In the present study, association between family history of breast cancer and pretest attitude scores among late adolescents was noted ($\chi^2$2= 148.24, df=84, *P*=0.0001).

Marital status: Marital status and pretest attitude scores among late adolescents were found to be significantly associated ($\chi^2 2$= 168.36, df=42, *P*=0.0001).

Previous training on breast cancer: In the present study, an association between previous training on breast cancer and pretest attitude scores among late adolescents was noted ($\chi^2 2$= 124.39, df=42, *P*=0.0001).

Family annual income: Family annual income and pretest attitude scores were found to be significantly associated ($\chi^2 2$= 328.18, df=126, *P*=0.0001).

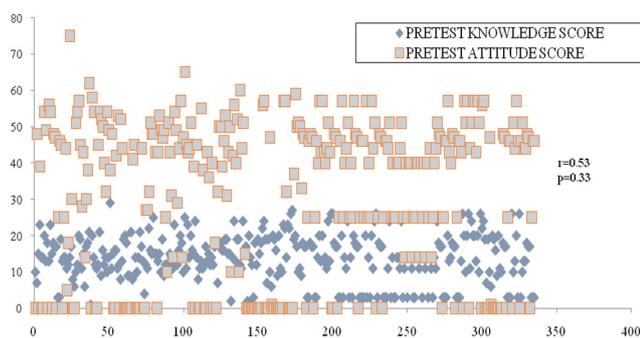**Findings related to correlation between pretest knowledge and pretest attitude scores**

Figure 6: Scatter diagram showing the correlation between pretest knowledge scores and pretest attitude scores

In the present study, mean±standard deviation for knowledge and attitude was noted to be 13.85±6.36 and 30.49±21.46, respectively. The r value was 0.53 with *P* value 0.33, indicating no correlation between pretest knowledge and pretest attitude scores (Figure 6).

Findings related to correlation between posttest knowledge and posttest attitude scores
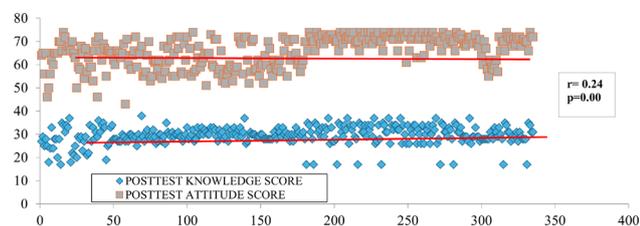

Figure 7: Scatter diagram showing the correlation between post-test knowledge scores and post-test attitude scores

In the present study, it was observed that the mean±standard deviation for knowledge and attitude was 29.61±3.94 and 65.93±6.52, respectively. The r value was 0.24 with *P* value <0.001, demonstrating

significant correlation between post-test knowledge and post-test attitude scores (Figure 7).

Discussion

Findings related to the demographic characteristics of late adolescents

Among 335 late adolescents included in the present study, 331 (98.80%) were in the age group of 18 to 20 years, while four (1.20%) late adolescents were 21 to 22 years of age. The study sample included degree-studying students, hence majority of participants were between 18 to 20 years of age. These findings are slightly different from the study conducted by Suvarna Madhukumar *et al.* among basic science students who were in the age range of 18 to 23 years, while Rumpa sarker *et al.*[2,3] reported a study among participants aged 18 to 26 years.

The gender distribution of the present study demonstrated that 143 (42.70%) of late adolescents were males, while 192 (57.30%) were females. Majority of the late adolescents were females who constituted the most vulnerable group for incidence of breast cancer. In contrast to these study findings, Rumpa Sarker *et al.* and Alshahrani, M *et al.* included exclusively females or both genders in their respective studies, with nearly equal numbers of males and females.[3,4]

Among the participants, 235 (70.10%) late adolescents belonged to Hindu religion, 26 (7.80%) were Muslims, 13 (3.90%) were Christians and while 61 (18.20%) belonged to other religions like Jainism, Zoroastrianism, Sikhism. Majority of the participants were Hindus in the present study.

In the present study, 102 (30.40%) of late adolescents had education qualification of pre-university, 231 (69.00%) were undergraduates and two (0.60%) of late adolescents were postgraduates. This is similar to the findings of the studies conducted by Madhu S *et al.*,[5] Zahar Mohebi *et al.,*[6] Suvarna Madhukumar *et al.,*[2] Amandeep Kaur,[7] Priyanka P, Mathew *et al.*[8] who included adolescents with varying education qualification ranging from higher education to graduation.

The present study found that 158 (47.20%) of late adolescents received information regarding breast cancer through mass media, 86 (25.70%) received information from health professionals, while 91 (27.20%) learnt about breast cancer from friends and family members. These findings related to sources of information about breast cancer were slightly similar

to the findings of Amandeep Kaur who reported the sources of information as mass media and paper media. Further, a study by Tahir Mehmood Khan *et al.*[6,9] reported the sources of breast cancer information as books, magazines, brochures and television.

The findings related to family history of breast cancer in the present study found that, 293 (87.50%) late adolescent families had no previous history of breast cancer while 41 (12.20%) had a family history of breast cancer. These 12.20% late adolescents are at high risk for developing cancer. These findings of the present study are similar to that of Nur E, Alam *et al.*[10] and Rumpa Sarker[3] where history of breast cancer played a significant role in the knowledge levels regarding breast cancer.

The marital status of the late adolescents in the present study showed that 333 (99.40%) late adolescents were unmarried and only two (0.60 %) of the participants were married. This finding in the present study is slightly different from the study reported by Alam NE *et al.*[10] where majority of participants were married and Nema Ram Gurjar reported 87.50% subjects to be married.[11]

In the present study, 10 (3.00%) participants received training on breast cancer two years ago, while 325 (97.00%) participants had no training on breast cancer. This gives a solid base for present study as the self-instruction module is a teaching learning tool that can aid adolescents to improve knowledge on breast cancer.

In the present study, 184 (54.90%) late adolescents reported a family annual income of less than Rs.100000/-, 120 (35.80%) reported an annual income of Rs.100001/- to Rs.300000/-, 12 (3.60%) reported an annual income of Rs.300001/- to Rs.500000/-, 19 (5.70%) late adolescents reported an annual income of more than Rs.500001/. This shows that majority of the participants had satisfactory socio economic status. The findings of the present study are similar to those reported by Amandeep Kaur who included monthly income in their study and Nema Ram Gurjar who reported monthly family income of less than Rs.10000/-.[6,11]

Findings related to the knowledge of late adolescents regarding breast cancer

In the present study with the maximum knowledge score of 38, the pre-test score was found to be 28, with a minimum score of two and maximum score of 17 and mean±standard deviation of 13.86±6.36. These findings are similar to the study conducted by Hasanthika *et al.*[12]

and Zahra Mohebi on the knowledge of adolescents regarding breast cancer which revealed deficiency in knowledge. In post test, the score was found to be 21, with a minimum score of 17 and maximum score of 38 with mean±standard deviation of 29.61±3.94, which showed a significant improvement in the knowledge score of late adolescents regarding breast cancer.[8]

Findings related to the attitude of late adolescents regarding breast cancer

In the present study with a total maximum attitude score of 75, the pre-test score was found to be 75, with a minimum score of zero and maximum score of 75 and a mean±standard deviation of 30.49±21.46. These findings are similar to the study conducted by Hasanthika *et al.*[12] and Zahra Mohebi who reported poor attitude among adolescents regarding breast cancer.[8] In post-test, it ranged at 31, having a minimum score of 43 and maximum score of 74 with mean±standard deviation of 65.93±6.52 indicating a significant improvement in the attitude of late adolescents regarding breast cancer.

Findings related to the effectiveness of self-instruction module on knowledge regarding breast cancer

In the present study, it was found that the knowledge aspect regarding anatomy and physiology of breast, breast cancer and causes of breast cancer, diagnosis of breast cancer, treatment of breast cancer and preventive measures of breast cancer were significant with t value 25.40, 23.53, 23.03, 24.34, and 31.67 at degrees of freedom 334 and *P* value ≤0.001, respectively. The student t value for overall knowledge was 33.54 at 334 degrees of freedom with *P* value <0.001 showing the significance of self-instruction module in improving the knowledge among late adolescents. These findings of the study are similar to the findings reported by Shreyas Shripad Walvekar *et al.* and Devika C who found the effectiveness of self-instruction module at *t* value 23.90 and *t* 37.25 at 0.05, respectively.[13,14]

Findings related to the correlation between pretest knowledge and attitude scores

In the present study, no correlation was found between pre-test knowledge and attitude scores for mean±standard deviation of knowledge and attitude of 13.85±6.36 and 30.49±21.46, respectively, with r value of 0.53 and *P* value of 0.33. These findings are in contrast to the findings of Rumpa sarker *et al*. who revealed the correlation between knowledge and practice of breast cancer (*P* = 0.01)[3]

Findings related to the correlation between post-test knowledge and attitude scores

In the present study, a significant correlation between post-test knowledge and attitude scores was noted for mean±standard deviation of knowledge and attitude of 29.61±3.94 and 65.93±6.52, respectively, with r value of 0.24 and *P* value <0.001. These findings of the posttest study are similar to the findings of study Rumpa Sarker *et al.* and Poonam Sharma *et al.* who revealed correlation between knowledge and practice of breast cancer (*P*=0.01).[3,15]

Conclusion

The aim of the present study was to assess the effectiveness of self instruction module on knowledge and attitude regarding breast cancer among late adolescents studying at selected degree colleges. One group pretest posttest design was adopted, and the study was conducted including 335 late adolescents selected using non-probability purposive sampling technique. The data was collected using structured knowledge and attitude questionnaire, and the participants were from Oxford Degree College, Hubli-Dharwad. A pretest was conducted to collect the data regarding knowledge and attitude of late adolescents following which self-instruction module was administered. The post-test was conducted after 30 days, the collected data was tabulated, computed, analyzed using SPSS 20.0 version software. The results of the study revealed a significant difference in mean pretest knowledge and attitude scores and mean posttest knowledge and attitude scores. This was evidenced by increase in posttest knowledge and attitude scores compared to pretest knowledge and attitude scores signifying the effectiveness of self-instruction module. Further the study assessed the association between pretest knowledge and attitude scores with selected demographic variables. The study found that except age, the gender, religion, educational qualification, source of information, family history of breast cancer, marital status, previous training on breast cancer, family annual income showed significant association with pretest knowledge and attitude scores. The assessment of knowledge and attitude levels showed that the percentage of posttest knowledge and attitude levels were greater than pretest knowledge and attitude levels. The study also found no correlation between pretest knowledge and pretest attitude scores. To conclude, this study signified the effectiveness of self-instruction module in improving the knowledge and attitude of the late adolescents regarding breast cancer.

Recommendations

Breast cancer is preventable. Early diagnosis, awareness about cancer and its management aids in managing the disease before progress. Experimental studies including control group can be done in future.

A structured teaching program or a planned training module can be prepared and executed to improve the knowledge of the population regarding breast cancer and its prevention.

A large group study including major population of adolescents should be focused as they comprise vulnerable population and can act upon to prevent cancer with adequate awareness and proper attitude.

Further studies on other cancers like cervical cancer, lung cancer, bone cancer should be conducted to sensitize the adolescent population as they are at equal risk for developing mutational changes in cells due to modifiable risk factors.

The present study adds to the data base of the pool of knowledge on breast cancer awareness among adolescents. This data can be used for future research studies using evidence based research and research methodology to draw the evidenced based review regarding breast cancer knowledge and attitude among adolescents.

The present study was conducted in a small geographical area involving a small sample. Similar studies targeting larger geographical area, large sample size can be conducted for generalization of research findings and to cover large group of adolescent population.

Conflict of interest
None

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