



Educational Strategies for Enhancing Breast Self-Examination Knowledge and Attitudes among Adolescents: A Quasi Experimental Design

Mrs. Sivagami P^{1*}, Dr. Sumit Padihar²

^{1*} Ph.D Scholar, Mansarovar Global University, Bhopal, Madhya Pradesh, India.

² Research Supervisor, Mansarovar Global University, Bhopal, Madhya Pradesh, India.

Corresponding author: Mrs. Sivagami P

Email: sivagamivenkataramani@gmail.com

(Received: 11 June 2024

Revised: 16 July 2024

Accepted: 10 August 2024)

Keywords

Breast cancer, Knowledge, Attitude, Self-examination, Self-structure questionnaire

Abstract: This study evaluated the impact of an educational intervention on adolescents' knowledge, attitudes, regarding breast self-examination (BSE). A quasi-experimental design was used with 60 female secondary school students. Pre- and post-intervention questionnaires assessed participants' awareness of breast cancer, BSE techniques, and attitudes towards BSE. The educational program included presentations, demonstrations, and practical training on BSE. Results showed significant improvements across all measured parameters. Knowledge of breast cancer and BSE techniques increased substantially. Attitudes shifted positively, with more students recognizing the benefits of BSE and feeling confident in performing it accurately. The ability to correctly perform BSE also improved markedly. Statistical analysis revealed significant differences between pre- and post-intervention responses ($p < 0.0001$). The findings demonstrate the effectiveness of targeted educational programs in enhancing BSE awareness among adolescents, potentially contributing to early breast cancer detection efforts.

Introduction

It was alarming to witness the upward trend in breast cancer prevalence in Africa, in particular in Nigeria [1–3]. It was estimated that breast cancer contributes to the highest cancer mortality rates among women in developing countries [1, 4–6]. Breast cancer affects about 1.15 million women worldwide every year, and 502,000 die of it [7, 8]. Developing countries were expected to account for more than 70% of all new cancer cases by 2020. Breast cancer was the leading cause of cancer death in women, with an incidence of 33.3 cases per 100,000 [9, 10]. Although breast cancer was prevalent in developing nations, there was little awareness of the disease [11–14]. It was vital to detect and manage breast cancer early through periodic mammograms, clinical breast

examinations (CBEs), and monthly self-examinations (BSEs). [15–17]. A great deal of resistance has been encountered in developing countries with regard to cancer screening and treatment [18, 19]. Furthermore, most cancer patients present themselves late for treatment, especially in situations when little or no can be done. There was a lack of knowledge regarding risk factors, symptoms, screening methods and treatment options related to various cancers [18, 20, 21]. There was a high cost and a need for specific manpower resources for breast cancer screening, making it unaffordable expensive. As it requires no special skill or material, breast self-examination remains the cheapest, non-invasive and easiest method to follow. In only 5 minutes, it was one of the most effective screening methods for breast cancer [1, 4, 22, 23]. Several studies indicate that



BSE performs well in detecting breast cancer [24–26]. BSE helps a woman know what her breast tissue usually looks like and makes her more aware of any abnormal changes that might occur [27, 28]. In order to successfully implement breast cancer control activities, knowledge, attitudes, related to BSE need to be assessed. [29]. There was limited awareness and practice of clinical breast self-examinations and breast self-examinations, however [5, 9, 30]. Detecting breast cancer early and accessing care were two of the main goals of the American Cancer Society's breast self-examination recommendations for women starting in their 20s [31]. The procedure requires knowledge of cancer risk factors, symptoms, screening methods, and basic procedures on how to conduct a BSE. [31]. The adolescent years provide an opportunity for shaping healthy behaviors into adulthood as a result of rapid development [2, 32]. There was a high need for breast self-examination education among Iranian women, according to a study [33]. In Nigeria, studies were conducted to investigate adolescents' knowledge, attitudes, concerning BSE [2, 19, 34, 35], There have been no studies focused on the impact of an educational programme to equip adolescents with knowledge and procedures for performing a BSE, which is also not included in the student curriculum. Teachers, who should be a source of information, change agents, and role models on sexual health for adolescents in schools, showed low knowledge, low practice, and a negative attitude toward BSE. [34]. In addition, a study on secondary school students in Nigeria indicates that they have limited knowledge about breast cancer and BSE, and that this needs to be addressed. [2]. Hence, this study was developed as an educational and promotional program for BSE. This study aims to examine how education impacts the knowledge, attitude towards BSE education practices.

Methodology

A quasi experimental study was done over 60 samples that was fulfilled the sample selection criteria were selected as sample by using non-probability purposive sampling technique and Knowledge and attitude were assessed through self-structured questionnaire. The data were

collected by self-administering a questionnaire, adapted from previous studies and validated for this study [2, 5, 9, 11, 13, 14, 23, 25]. Each section of the instrument consisted of 30 items with categorical and continuous variables. As part of Section A, students were assessed in relation to their demographic characteristics (age groups, classes, religions). In section B, students are asked 11 questions about their knowledge of breast cancer and BSE. As part of Section C, students are asked to respond to 10 questions regarding their attitude and practice of breast self-examination on Likert scales. In order to analyze and compare the responses, the questionnaire was administered twice to students within a two-week interval. Researchers validated content and constructs based on the expertise of three specialists in adolescents' health and health promotion.

Data Collection

The students were assessed on their knowledge, attitudes, regarding BSE between 2023-2024, followed by 6 sessions of educational training on BSE lasting about 45-60 minutes with about 60 students in each session. For participation, confidentiality, and to prevent stigmatization, students were asked to write questions for further clarification. The study provided the students with a leaflet on BSE and the telephone number of the presenters in case they needed further information or had any questions. The attendance at each session was collected. The instrument was given to the same group of students after 8 weeks of the educational programme to evaluate their post-educational knowledge, attitudes, and breast self-examination practices.

Data analysis

Statistical Package for the Social Science (SPSS) version 20 was used to cross-check, code, and enter the data collected. An association and difference between relevant variables was examined using descriptive statistics including frequency, percentages, and measures of central tendency, chi-square tests, and independent t tests at 0.05 significance level (p value)



Results and discussion

A total of 60 participants with varying demographics and backgrounds were included in the study. There was a majority of respondents (60%) between the ages of 17 and 19, followed by those between 16 and 17 (23.33%) and those between 19 and 22 (16.66%). There were 78.33

percent Hindus among the participants, 13.33 percent Christians, and 8.33 percent Muslims. The majority of participants were in senior secondary schools, with 65% in SSC-2, 21.66% in SSC-1, and 13.33% in SSC-3. 45% of breast self-examination (BSE) information was obtained from healthcare professionals, 35% from social media/newspapers, and 20% from parents/relatives.

Table: 1 Socio-demographics characteristics of subjects (n=60)

Variables	Frequency n=60	Percentage (%)
Age		
16-17	14	23.33%
17-19	36	60%
19-22	10	16.66%
Religion		
Hindu	47	78.33
Christian	8	13.33
Muslims	5	8.33
Class (Senior Secondary Class)		
SSC-1	13	21.66
SSC-2	39	65
SSC-3	8	13.33
Knowledge about BSE obtained previously through		
Parents/ Relatives	12	20
Social Media/newspaper	21	35
Health care Professional	27	45

The table 2 presents the study results on participants' knowledge of Breast Self-Examination (BSE) before and after an intervention. Initially, 48 participants had heard of breast cancer, increasing to 56 post-intervention. Familiarity with breast cancer symptoms also rose, from 41 participants to 49. The number of participants with a first-degree relative diagnosed with breast cancer decreased

from 21 to 6, and those diagnosed with a breast issue dropped from 16 to 3. Knowledge of how to perform BSE correctly saw a notable increase, from 13 to 31 participants, and the ability to perform BSE on themselves rose from 21 to 29. Understanding the correct steps for BSE improved significantly, from 19 to 48 participants, and awareness of the necessary frequency for BSE



increased dramatically, from 12 to 49. The ability to detect abnormalities through BSE rose from 6 to 15 participants, and awareness of the steps to take if a problem is detected increased from 11 to 47. Additionally, the need for a training program in

proper BSE was recognized by more participants post-intervention, rising from 41 to 46. Overall, the intervention significantly improved participants' knowledge and attitude related to BSE.

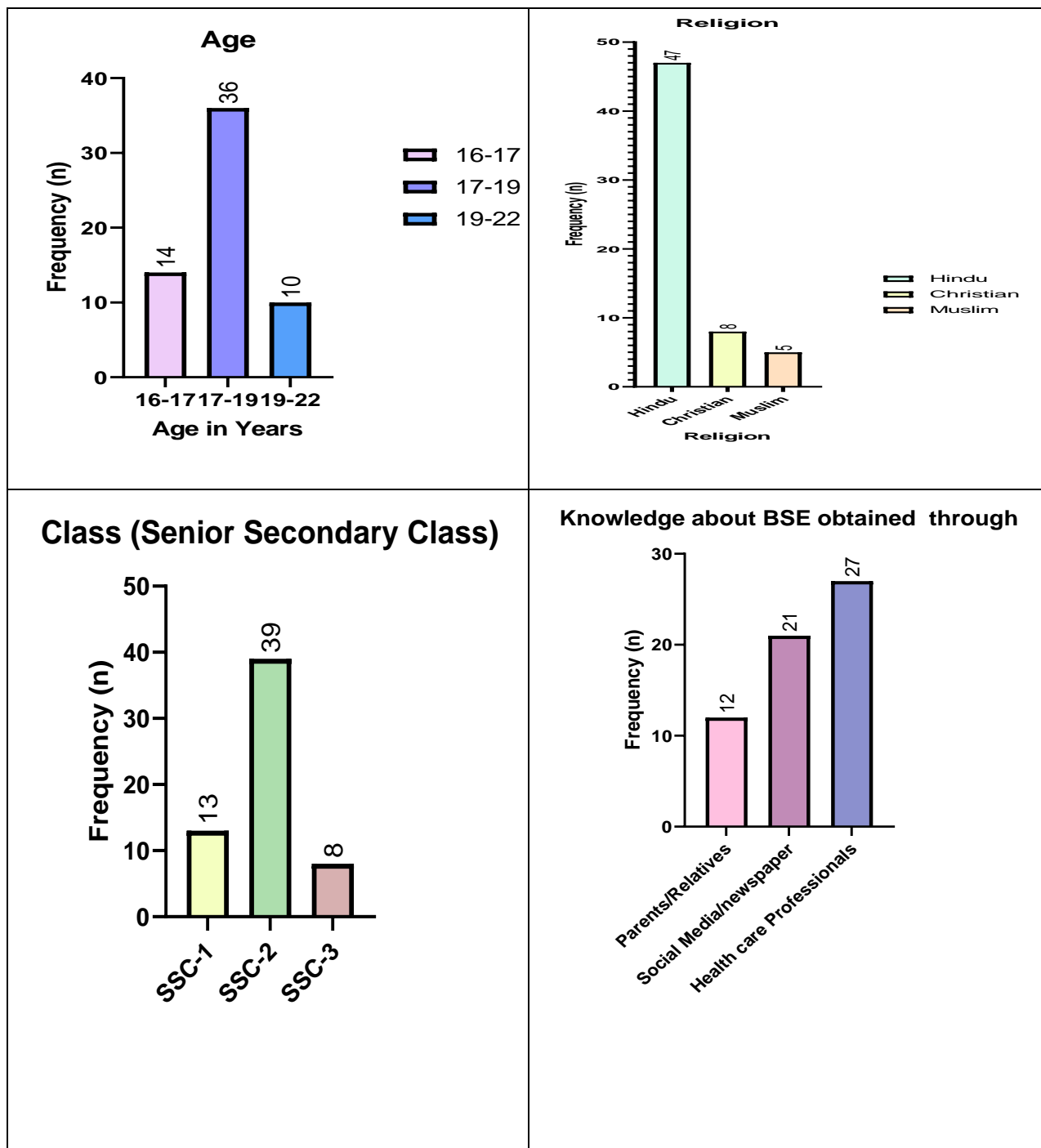




Table: 2. Study knowledge of BSE Pre and Post intervention

Questionnaire	Pre-test		Post test		χ^2 and df	P value
	Yes	No	Yes	No		
Q1	48	12	56	4	386, 30	<0.0001 ***
Q2	41	19	49	11		
Q3	21	39	6	54		
Q4	16	44	3	57		
Q5	13	47	31	29		
Q6	21	39	29	31		
Q7	19	41	48	12		
Q8	12	48	49	11		
Q9	6	54	15	45		
Q10	11	49	47	13		
Q11	41	19	46	14		
Chi-Square, df	142,10		244 10			
P value	<0.0001***		<0.0001***			

A significant difference was observed between the pre-test and post-test results for the questionnaire. The positive response rate increased across multiple questions and the negative response rate decreased. CHI-square analysis for 10 degrees of

freedom yielded p-values of less than 0.0001 for the overall chi-square analysis with 142 and 244 values. Based on the results of the pre- and post-tests, it appears that significant differences have occurred between the two phases.

Table: 3 Students attitude level on BSE pre and post intervention

Questionnaire	Pre-test				Post test				Chi square, Df, p value
	Agree	Strongly agree	Disagree	Strongly disagree	Agree	Strongly agree	Disagree	Strongly disagree	
Q1	9 (15)	19 (31.66)	3 (5)	29 (48.3)	42 (70)	11 (18.33)	5 (8.33)	2 (3.33)	662,63 <0.0001** *
Q2	0	18 (30)	4 (6.66)	38 (63.33)	37 (61.66)	19 (31.66)	1 (1.66)	3 (5)	



)				
Q3	33 (55)	5 (8.33)	22 (36.66)	0	28 (46.66)	11 (18.33)	13 (21.66)	8 (13.33)	
Q4	38 (63.33)	11 (18.33)	7 (11.66)	4 (6.66)	17 (28.33)	15 (25)	19 (31.66)	9 (15)	
Q5	27 (45)	13 (21.66)	5 (8.33)	15 (25)	11 (18.33)	12 (20)	21 (35)	16 (26.66)	
Q6	4 (6.66)	10 (16.66)	15 (25)	31 (51.66)	5 (8.33)	11 (18.33)	27 (45)	17 (28.33)	
Q7	12 (20)	8 (13.33)	6 (10)	34 (56.66)	3 (5)	9 (15)	9 (15)	39 (65)	
Q8	8 (13.33)	20 (33.33)	32 (53.33)	0	37 (61.66)	13 (21.66)	8 (13.33)	2(3.33)	
Q9	3 (5)	13 (21.66)	44 (73.33)	0	28 (46.66)	19 (31.66)	8 (13.33)	5 (8.33)	
Q10	13 (21.66)	12 (20)	35 (58.33)	0	38 (63.33)	18 (30)	4 (6.66)	0	
Chi square, Df, p value	398, 27, <0.0001				263, 27, <0.0001				

The table 3 summarizes changes in students' attitudes towards Breast Self-Examination (BSE) before and after an intervention. Initially, only 15% agreed that BSE has many benefits, which increased to 70% post-intervention. The perception of BSE as a low-cost early detection method rose from 0% to 61.66%. Belief that BSE can be painful decreased from 55% to 46.66%. The view that BSE is time-consuming dropped from 63.33% to 28.33%. The difficulty of doing regular BSE decreased from 45% to 18.33%, and the belief that BSE requires too much effort decreased slightly. The ease of forgetting monthly BSE dropped from 20% to 5%. Confidence in performing BSE accurately increased from 13.33% to 61.66%. The

belief that BSE can detect abnormalities rose from 5% to 46.66%. Finally, the number of students taught to perform BSE accurately increased from 21.66% to 63.33%. Overall, the intervention positively impacted students' attitudes towards BSE. The chi-square values for the changes in responses were significant, with 398 (df = 27) and 263 (df = 27), both yielding p-values of less than 0.0001. These results indicate a statistically significant difference between the pre-test and post-test phases, demonstrating a significant impact on the participants' responses.

Discussion

The current study demonstrates significant improvements in knowledge, attitudes related to



breast self-examination (BSE) among adolescents. Our results show a marked increase in participants' awareness of breast cancer and BSE techniques, with the number of students who could correctly perform BSE. This substantial improvement echoes findings from similar interventional studies, such as those conducted in Saudi Arabia [36], which also reported significant knowledge gains post-intervention. The study revealed a dramatic shift in attitudes, with agreement on BSE benefits rising from 15% to 70%. This positive change aligns with research [37], who observed comparable improvements in attitudes following educational programs. Our findings further support the notion that targeted education can effectively address misconceptions and barriers to BSE practice. Confidence in performing BSE accurately increased from 13.33% to 61.66%, a finding consistent with studies [38]. This boost in self-efficacy is crucial, as it often translates to increased likelihood of regular BSE practice, as noted in longitudinal studies [39]. The statistically significant improvements observed across all measured parameters ($p < 0.0001$) underscore the effectiveness of our educational program. These results corroborate findings from systematic reviews, such as those which highlight the efficacy of structured interventions in improving breast cancer awareness and screening behaviors [40].

Conclusion

This study contributes valuable insights to the growing body of evidence supporting the efficacy of educational interventions in promoting BSE among adolescents. By significantly enhancing knowledge, attitudes practices, our findings underscore the potential of such programs to contribute to early detection efforts and, ultimately, to reduce breast cancer mortality rates.

References

- [1] Sanvido VM, Watanabe AY, de Araújo Neto JT, Elias S, Facina G, Nazário AC (2017) Evaluation of the efficacy of clinical breast examination gloves in the diagnosis of breast lumps. *J Clin Diagn Res* 11(6):XC01–XC05
- [2] Isara AR, Ojedokun CI (2011) Knowledge of breast cancer and practice of breast self examination among female senior secondary school students in Abuja, Nigeria. *J Prev Med Hyg* 52(4):186–190
- [3] Torre LA, Bray F, Siegel RL, Ferlay J, Lortet-Tieulent J, Jemal A (2015) Global cancer statistics, 2012. *CA Cancer J Clin* 65(2):87–108
- [4] World Health Organization, Breast cancer: prevention and control. 2018 <http://www.who.int/cancer/detection/breastcancer/en/>. Accessed 10 Aug 2018
- [5] Moustafa DG, Abd-Allah ES, Taha NM (2015) Effect of a breast self examination (BSE) educational intervention among female university students. *Am J Nursing Sci* 4(4):159–165
- [6] Loh SY, Chew SL (2011) Awareness and practice of breast self examination among Malaysian women with breast cancer. *Asian Pac J Cancer Prev* 12(1):199–202
- [7] World Health Organisation (2013) Breast cancer: prevention and control. WHO, Geneva <http://www.who.int/cancer/detection/breastcancer/en/>. Accessed 10 Aug 2018
- [8] Suh MA, Atashili J, Fuh EA, Eta VA (2012) Breast self examination and breast cancer awareness in women in developing countries: a survey of women in Buea, Cameroon. *BMC Res Notes* 5(1):627
- [9] Azubuike SO, Okwuokei SO (2013) Knowledge, attitude and practices of women towards breast cancer in Benin City, Nigeria. *Ann Med Health Sci Res* 3(2):155–160
- [10] Adetifa FA, Ojikutu RK (2009) Prevalence and trends in breast cancer in Lagos state, Nigeria. *Afr Res Rev* 3(5). <https://doi.org/10.4314/afrrrev.v3i5.51137>
- [11] Reisi M, Javadzade SH, Sharifirad G (2013) Knowledge, attitudes, and practice of breast self-examination among female health workers



- in Isfahan, Iran. *J Educ Health Promot* 2:46. <https://doi.org/10.4103/2277-9531.117417>
- [12] Fouladi N, Pourfarzi F, Mazaheri E, Asl HA, Rezaie M, Amani F, NejadMR (2013) Beliefs and behaviours of breast cancer screening in women referring to health care centres in Northwest Iran according to the champion health belief model scale. *Asian Pac J Cancer Prev* 14(11):6857–6862
- [13] Boulos DN, Ghali RR (2014) Awareness of breast cancer among female students at Ain Shams University, Egypt. *Global J Health Sci* 6(1):154
- [14] Ranasinghe HM, Ranasinghe N, Rodrigo C, Seneviratne RD, Rajapakse S (2013) Awareness of breast cancer among adolescent girls in Colombo, Sri Lanka: a school-based study. *BMC Public Health* 13(1):1209
- [15] Leung J, McKenzie S, Martin J, Dobson A, McLaughlin D (2014) Longitudinal patterns of breast cancer screening: mammography, clinical, and breast self-examinations in a rural and urban setting. *Womens Health Issues* 24(1):e139–e146
- [16] Ersin F, Bahar Z (2013) Barriers and facilitating factors perceived in Turkish women's behaviors towards early cervical cancer detection: a qualitative approach. *Asian Pac J Cancer Prev* 14(9):4977–4982
- [17] YilmazD, Bebis H, Ortabag T (2013) Determining the awareness of and compliance with breast cancer screening among Turkish residential women. *Asian Pac J Cancer Prev* 14(5):3281–3288
- [18] Karadag G, Gungormus Z, Surucu R, Savas E, Bicer F (2014) Awareness and practices regarding breast and cervical cancer among Turkish women in Gaziantep. *Asian Pac J Cancer Prev* 15(3):1093–1098
- [19] Catarino R, Petignat P, Dongui G, Vassilakos P (2015) Cervical cancer screening in developing countries at a crossroad: emerging technologies and policy choices. *World J ClinOncol* 6(6):281
- [20] Merriam S, Muhamad M (2013) Role's traditional healers play in cancer treatment in Malaysia: implications for health promotion and education. *Asian Pac J Cancer Prev* 14(6):3593–3601
- [21] Okolie UV (2012) Breast self-examination among female undergraduates in Enugu, southeast, Nigeria. *Int J Nurs Midwifery* 4(1): 1–7
- [22] Babu GR, Samari G, Cohen SP, Mahapatra T, Wahbe RM, Mermash S, Galal OM (2011) Breast cancer screening among females in Iran and recommendations for improved practice: a review. *Asian Pac J Cancer Prev* 12(7):1647–1655
- [23] Beydağ KD, Yürügen B (2010) The effect of breast self-examination (BSE) education given to midwifery students on their knowledge and attitudes. *Asian Pac J Cancer Prev* 11(6):1761–1764
- [24] Nde FP, Assob JC, Kwenti TE, Njunda AL, Tainenbe TR (2015) Knowledge, attitude and practice of breast self-examination among female undergraduate students in the University of Buea. *BMC Res Note* 8(1):43
- [25] Salama H, Elsebai N, Abdelfatah F, Shoma A, Elshamy K (2013) Effects of peer education on the knowledge of breast cancer and practice of breast self-examination among Mansoura University female students. *J Am Sci* 9(10):253–261
- [26] Verma S, Miles D, Gianni L, Krop IE, Welslau M, Baselga J, Pegram M, Oh DY, Diéras V, Guardino E, Fang L (2012) Trastuzumabemtansine for HER2-positive advanced breast cancer. *N Engl J Med* 367(19):1783–1791
- [27] Akhtari-Zavare M, Ghanbari-Baghestan A, Latiff LA, MatinniaN, Hosseini M (2014) Knowledge of breast cancer and breast self-examination practice among Iranian women in Hamedan, Iran. *Asian Pac J Cancer Prev* 15(16):6531–6534



- [28] Fotedar V, Seam RK, Gupta MK, Gupta M, Vats S, Verma S (2013) Knowledge of risk factors & early detection methods and practices towards breast cancer among nurses in Indira Gandhi medical college, Shimla, Himachal Pradesh, India. *Asian Pac J Cancer Prev* 14(1):117–120
- [29] Ibrahim NA, Odusanya OO (2009) Knowledge of risk factors, beliefs and practices of female healthcare professionals towards breast cancer in a tertiary institution in Lagos, Nigeria. *BMC Cancer* 9(1): 76
- [30] Akarolo-Anthony SN, Ogundiran TO, Adebamowo CA (2010) Emerging breast cancer epidemic: evidence from Africa. *Breast Cancer Res* 12(4):S8
- [31] Smith RA, Andrews K, Brooks D, DeSantis CE, Fedewa SA, Lortet-Tieulent J, Manassaram-Baptiste D, Brawley OW, Wender RC (2016) Cancer screening in the United States, 2016: a review of current American Cancer Society guidelines and current issues in cancer screening. *CA Cancer J Clin* 66(2):95–114
- [32] Rizvi F (2013) Knowledge and practice of breast self-examination. *J Rawalpindi Med College* 17(1):88–90
- [33] Ghodsi Z, Hojjatoleslami S (2012) A survey about educational needs of breast cancer and BSE in Iranian women. *Procedia Soc Behav Sci* 46:2561–2565
- [34] Faronbi JO, Abolade J (2012) Breast self-examination practices among female secondary school teachers in a rural community in Oyo state, Nigeria. *Open J Nurs* 2(02):111–115
- [35] Irurhe NK, Raji SB, Olowoyeye OA, Adeyomoye AO, Arogundade RA, Soyebi KO, Ibitoye AZ, Abonyi LC, Eniyandunni FJ (2012) Knowledge and awareness of breast cancer among female secondary school students in Nigeria. *Academic J Cancer Res* 5(1):1–5
- [36] Abolfotouh MA, BaniMustafa AA, Mahfouz AA, Al-Assiri MH, Al-Juhani AF, Alaskar AS. Using the health belief model to predict breast self examination among Saudi women. *BMC Public Health*. 2015 Nov 23;15:1163. doi: 10.1186/s12889-015-2510-y. PMID: 26596507; PMCID: PMC4657230.
- [37] Sapountzi-Krepia D, Rekleiti M, Lavdaniti M, Psychogiou M, Chaliou M, Xenofontos M, Savva M. Evaluating female nursing students' knowledge and attitudes regarding breast self-examination. *Health Care Women Int*. 2017 Aug;38(8):786-795. doi: 10.1080/07399332.2017.1326921. Epub 2017 May 8. PMID: 28481177.
- [38] Akhtari-Zavare, M., Juni, M.H., Said, S.M. et al. Result of randomized control trial to increase breast health awareness among young females in Malaysia. *BMC Public Health* 16, 738 (2016). <https://doi.org/10.1186/s12889-016-3414-1>
- [39] Austoker J, Bankhead C, Forbes LJ, Atkins L, Martin F, Robb K, Wardle J, Ramirez AJ. Interventions to promote cancer awareness and early presentation: systematic review. *Br J Cancer*. 2009 Dec 3;101(Suppl 2(Suppl 2)):S31-9. doi: 10.1038/sj.bjc.6605388. PMID: 19956160; PMCID: PMC2790702.
- [40] Secginli S, Nahcivan NO. The effectiveness of a nurse-delivered breast health promotion program on breast cancer screening behaviours in non-adherent Turkish women: A randomized controlled trial. *Int J Nurs Stud*. 2011 Jan;48(1):24-36. doi: 10.1016/j.ijnurstu.2010.05.016. Epub 2010 Jun 19. PMID: 20646706.