ORIGINAL ARTICLE

Effectiveness of Health Education Programme on Teenagers' Breast Self-Examination Practices at Kedah Secondary School

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ABSTRACT

Introduction: Worldwide and in Malaysia, breast cancer is the most common cancer and the second leading cause of death for women. One of the most important steps in identifying breast tumours early on is Breast Self-Examination (BSE). Teenagers should, therefore, start thinking about breast health at a young age. Teens will be equipped with the knowledge necessary to do the recommended monthly BSE. This study assesses how a health education programme affects teenage girls in secondary schools in terms of their perspectives on BSE. **Methods:** Purposive sampling was used to pick 60 participants for the quasi-experimental study from one secondary school. The course on health education was offered online for one and a half hours. The outcome measure was evaluated four weeks after the health education program's implementation. Data analysis was done using the Paired t-test. **Results:** There were notable distinctions between the pre-and post-intervention mean scores for knowledge of breast cancer and breast self-examination ($p<.001$), attitude towards BSE ($p<.001$), and BSE practice ($p<.001$). **Conclusions:** Thus, it is imperative to introduce a BSE education programme for girls in secondary schools to improve their understanding, perspective, and application of early breast cancer prevention. Early education for this demographic may have an impact on reducing the death rate by reducing the number of cases of advanced breast cancer that are discovered.
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INTRODUCTION

Worldwide, cancer is the second largest cause of death, with breast cancer, the most common form of the disease, being the second leading cause of death among women. Cancer is the second most prominent cause of death worldwide. From 6.2 million in the year 2000, the number of fatalities that are attributed to cancer is expected to increase to 10 million by the year 2020 (1). This increase in numbers needs to be handled in the interest of women's health worldwide. Every woman who is 20 years of age or older is thought to be at risk of breast cancer.

Breast cancer is the most frequently diagnosed cancer among women in the U.S., accounting for approximately 30% of all new cancer cases in women each year (2). In 2020, breast cancer became the most common cancer worldwide, with 2.3 million new cases diagnosed, surpassing lung cancer (3). It represents 24.5% of all cancers affecting women, with nearly half (45.4%) of these cases being diagnosed in Asia (4). Although the incidence of breast cancer in Asia remains lower than in Western countries, its proportional contribution to global breast cancer rates is rising rapidly. This increase is driven by factors such as rapid economic growth, urbanization, and improvements in socioeconomic status across the region. Breast cancer is the most prevalent cancer in Malaysia, increasing from 17.7% to 19%, according to a data study by the Malaysia National Cancer Registry 2016 (5). (that is the latest data by MNCR)

Therefore, the early stages of the preventative program are essential for primary prevention to improve breast health among Malaysian women through education and awareness programs. BSE is one of the most critical steps in detecting breast tumours early. According to prior research, early cancer detection is associated with a better prognosis and a higher chance of successful therapy (6). Unfortunately, breast cancer is often found too late in Malaysian women because of a lack of cancer awareness (7). This demonstrates the need to increase women's education and understanding regarding breast

cancer.

Screening for breast cancer can be done in a variety of ways, including through BSE, clinical breast examination (CBE), or by using a device like a mammogram. Females physically inspecting their breasts is known as BSE. Breast cancer can be detected early using BSE, a home-based screening approach. This is a rapid, low-cost, straightforward, and practical approach to looking for any physical or visual irregularities in breast tissue. It is advised every month, one week after the menstrual cycle, often from the seventh to the tenth day. The advantage of BSE for females is that they can identify early breast abnormalities and promptly notify medical professionals. In addition, BSE improves women's chances of receiving treatment by raising their survival rates. Improving the education and understanding of BSE will impact the future of reducing breast cancer mortality and morbidity in Malaysia.

Breast cancer often goes undetected until advanced stages in Malaysia due to low cancer awareness (8). Research findings indicate that knowledge, attitudes, and practices (KAP) related to BSE are inadequate among teenagers (9-11). Adequate knowledge is crucial in promoting and adopting healthy behaviors (12). Unfortunately, insufficient knowledge and preventive practices persist in these regions, highlighting the importance of early education targeting teenage high school girls.

Improved awareness of breast cancer can facilitate adherence to screening guidelines, leading to early cancer detection and better management by healthcare providers. Previous research in Malaysia has focused less on female secondary school students compared to university students in interventions aimed at raising breast cancer awareness, as evidenced by several studies (11,8,9,13,14). Adolescence is a critical period for shaping lifelong health behaviors (15). Research has demonstrated that BSE is an effective method for identifying breast cancer patients, making it an essential tool for the early diagnosis of breast cancer symptoms (13).

A limited study has been conducted in Malaysia regarding BSE educational interventions among adolescent girls in secondary schools (16). Educational interventions can familiarize young women with breast self-awareness, encouraging the adoption of lifelong breast self-care practices, including BSE (9). Implementing BSE educational programs among teenagers could be an effective strategy to reduce breast cancer morbidity, advanced stages of breast cancer, and mortality in the future.

The teens' knowledge will eventually allow them to perform breast self-examinations monthly as advised. Later, they will continue to act this way for the rest of their lives. Knowledge regarding breast cancer and its early diagnosis should be disseminated throughout the school-aged population. This study aimed to investigate whether health education has an influence on the KAP of teenage females who are enrolled in secondary school in BSE. Health education programmes can allow young ladies in secondary school to acquire new knowledge. Making improvements in KAP will influence the future of lowering the mortality and morbidity rates associated with breast cancer in Malaysia.

MATERIALS AND METHODS

Study design

This research employs a one-group pretest-posttest quasi-experimental design, which is suitable when researchers cannot assign individuals to groups to test the impact of group membership on a specific outcome (17).

Study setting

This study was conducted on female students at Sekolah Menengah Kebangsaan Kulim (SMKK). The Kulim district education officer recommended this school because it is an excellent school in the Kulim district, as the Ministry of Education reported. It often achieves outstanding success in various fields, especially curriculum and co-curricular.

Sample

The purposive sampling method was established based on the researcher's judgment that they possess the necessary attributes for inclusion in the study. The inclusion criteria for this study encompassed female students aged 13 to 16 years without a history of chronic illness who were proficient in Malay and English. Exclusion criteria comprised female students on medical leave or transferred during data collection and those currently enrolled in the SPM examination year.

Sample Size Calculation

According to a sample size of a previous study by Sapkota et al. (18), They take 20 % of the female student population in one school. There are 315 female students in total in this study (data from school officials); following the four-week follow-up, a 10% attrition rate is anticipated. Sixty-nine participants were so forced to participate. Only sixty participants, nevertheless, completed the pretest, sought out online health information, and completed the post-test within the allotted time. The sample size calculation can be referred to in **Table I.**

Table I: Sample size calculation

The total population of female student	315	
20 % of the female student population	$\frac{20 \times 315}{100}$	63
10% attrition rate	$\frac{63 \times 10}{100}$	6.3
Total participant	69	

Instrument

Educational program: A knowledgeable nursing tutor from MOH led an educational program that lasted 1 1/2 hours and was performed online (Google Meet). The breast cancer awareness education program has been adapted and adopted by the Ministry of Health (19). A health educational program was directed to improve teenage girls' familiarity with breast cancer and BSE and promote their BSE practice. Respondents were given a BSE pamphlet providing BSE practice procedures at the end of the health education session. This pamphlet was adapted from MOH (19). The distribution of this leaflet online encourages the practice of BSE while reinforcing the desired message. The health education program activities were conducted as shown in **Table II**.

Table II: Health education program

Unit	Content	Educational Objective	Learning Method	Time
1	Knowledge of Breast Cancer & Breast Self-Examination - Epidemiology of breast cancer - Anatomy structure of the breast - Type of breast cancer - Signs and symptoms of breast cancer - Risk factors of breast cancer - Prevention of breast cancer - Primary and secondary prevention - What is a BSE? - Indication of BSE - The advantage of BSE	To provide knowledge and alertness of breast cancer, then the importance of breast self-examination.	Lecture/ discussion by using a PowerPoint presentation	1 hour
2	Knowledge of BSE Procedure - Step in BSE (observe, feel, and respond to any changes at the breast)	To provide a clear picture regarding the steps of BSE and identify any abnormalities in their breast. To give the respondent a Clear picture to palpate and recognize the structure of the lump.	Video show. The researcher is using a dummy breast with a lump.	25 minutes
4	Pamphlet (Step of BSE) - Three steps of the BSE procedure	As a reference source to the respondent after the program	An online pamphlet was shared with the respondent	5 minutes

Questionnaire: The questionnaire adopted from Zain et al. (16). Knowledge about self-examination and breast cancer. Questions regarding practice and attitude are modified versions adapted from Ali et al. (9). The breast cancer knowledge and BSE assessment showed a Cronbach's alpha of 0.78, indicating high internal consistency. The BSE practice showed a Cronbach's alpha of 0.72, indicating strong internal reliability. The participants' attitudes towards BSE were assessed using a Cronbach's alpha coefficient of 0.71, which showed satisfactory internal consistency in measuring this element.

The questionnaire consists of sections A, B, C, and D. Permission was obtained from the author for the questionnaires. The degree of KAP about BSE was divided into two categories: bad (scores below the median) and good (scores above the median). The median total score for understanding BSE was 15.5. Poor knowledge was scored between 0 and 15.4, whereas strong knowledge was assessed as between 15.5 and 31. The median aggregate score for attitude was 3.5. A score below 3.4 was classified as a poor attitude, whereas a score between 3.5 and 7.0 was considered good. The median total score for practice is 4. A score of 0 to 3.9 was categorised as poor practice, and a score of 4.0 to 8.0 was acceptable.

Data Collection

The Research Ethics Committee of the Universiti Teknologi MARA (REC) UITM REC/09/2021(MR/834) approved the study. Following ethical approval from Universiti Teknologi MARA (UiTM), the researcher coordinated with the school principal to gather pre-intervention data. All parents and respondents were informed of the study's purpose, had given an informed consent sheet, and had completed written answers that were essential to be returned to the researcher. Written consent was obtained from the parents who participated in this study. The researcher also informed respondents that they could choose whether to partake in the survey, deprived of the danger of consequence or prejudicial treatment, and the right to extract from the study at any time if they felt uncomfortable.

Utilizing online platforms for data collection, such as a specially created Telegram account, facilitated communication with selected participants. The researcher provided the school with a Telegram link to distribute to eligible participants, through which questionnaires were administered via Google Forms. Questionnaires via Google Forms were given a week before the health education program was conducted. After completing the education program and after four weeks, the participants were required to answer the same preliminary question in the pretest questionnaire through a Google form.

Pre-questionnaires were completed one week before the intervention, with participants allotted 40 minutes for response. The educational session, led by an expert nursing tutor with a master's degree and over ten years of clinical experience, lasted approximately 1 hours. The session incorporated multimedia presentations illustrating BSE procedures and educational pamphlets distributed to participants. Four weeks post-intervention, participants were presented with the same preliminary questions as in the pretest questionnaire. The data collection process is shown in **Figure 1**.

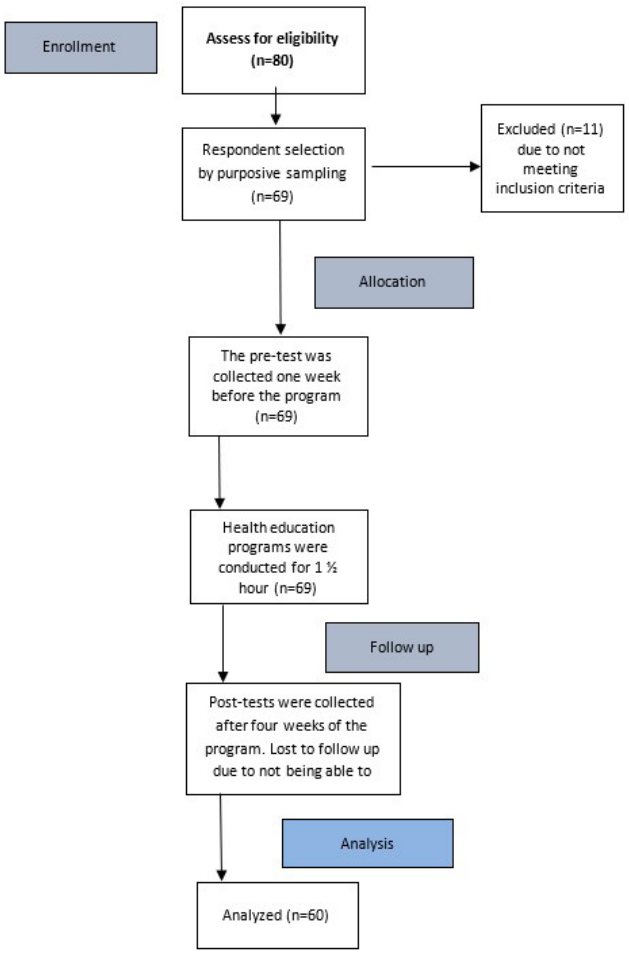

Fig. 1: Flow of data collection

Data analysis

The data were evaluated using Statistical Package for the Social Sciences (SPSS) version 26 to answer the research objectives. Descriptive frequency, percentage, and central tendency statistics were applied to summarize the respondent's socio-demographic characteristics. By comparing pre- and post-intervention data, the inferential statistic known as the paired t-test was computed to ascertain the impact of health education programmes on KAP about BSE. Given that the two observations are paired, and the differences between them (pre- and post-test) are normally distributed, a paired t-test was employed.

RESULTS

Demography Characteristics

Sixty secondary school girls in Sekolah Menengah Kebangsaan Kulim, Kedah, were involved in these studies. A summary of the samples' circumstantial data is revealed in **Table III**. More than half of the study respondents comprised students aged 15 and 16, while 13 -14-year-old students were involved as a sample of 33.3% of the total respondents. The respondents comprised a majority number of Malay students, 91.7%, while Indian students made up about 5.0% of the total samples. Chinese and other students were the least involved as a sample in this study, 3.4%. Most of the respondents involved in this study began menstruation at the age of 12 years.

Table III: Data demographics

Demography	Frequency	Percentage
Age (Year)		
• 13	9	15.0
• 14	11	18.3
• 15	22	36.7
• 16	18	30.0
Race		
• Malay	55	91.7
• Chinese	1	1.7
• Indian	3	5.0
• Others	1	1.7
Age starts menstruation (Year)		
• 10	3	5.0
• 11	13	21.7
• 12	25	41.7
• 13	14	23.3
• Others	5	8.3
Father's educational level		
• SPM	36	60.0
• Diploma	15	25.0
• Degree	7	11.7
• Master	1	1.7
• PhD	1	1.7
Father's working status		
• Civil servants	13	21.7
• Private servants	30	50
• Self-employed	9	15.0
• Not working	8	13.3
Mother's educational level		
• SPM	36	60.0
• Diploma	10	16.7
• Degree	13	21.7
• Master	1	1.7
Mother's working status		
• Civil servants	18	30.0
• Private servants	7	11.7
• Self-employed	3	5.0
• Not working	32	53.3
Family income		
• Less than RM 4 849	38	63.3
• RM 4 850 to RM 10 959	19	31.7
• More than RM 10 960	3	5.0
Does a family member have breast cancer?		
• Yes	2	3.3
• None	58	96.7

*Descriptive Analysis

Regarding the educational background of students' parents, the majority of students' parents are educated up to SPM level,60%. 25% of students' fathers are educated up to diploma level, while 16.7% of students' mothers are educated at the same level. 11.7% of fathers and 21.7% of students' mothers were degree holders. The least parents who are master's holders was reported by 1.7% of the sample, while only 1.7% of students' fathers furthered their studies to PhD level. In the employment sector, half of the students' fathers work in private. However, more than half of their mothers were unemployed. Furthermore, the number of self-employed

mothers was the lowest. Most student families had a household income of less than RM4 849. In addition, the majority of students also do not have family members who have breast cancer.

The Effect of Health Education Programs Toward Knowledge on BSE Among Teenage Girls in Secondary School

Table IV, presents findings showing a statistically significant difference in knowledge gain before (M=18.47, SD=4.51) and after (M=25.87, SD=3.65) participation in the health education programs, t (59) = -10.12, p = 0.001. The mean increase of 7.4 points, with a 95% confidence interval ranging from -8.86 to -5.94, indicates that the health education programs effectively enhanced students' breast self-examination (BSE) knowledge.

Table IV: Score Before and After Intervention on Knowledge of BSE among Teenage Girls(n=60)

	Pre - Intervention	Post- Intervention	t-statistics (df)	p-value
Mean (SD) Score	3.70 (1.88)	5.30 (1.60)	6.73 (59)	**0.001**

*Paired t-test

The Effect of Health Education Programs Toward Attitude on BSE Among Teenage Girls in Secondary School

In **Table V**, the findings reveal a disparity in attitude means before (M = 5.25, SD = 0.60) and after (M = 6.32, SD = 0.54) participation in the health education programs, t (59) = - 12.05, p = 0.001. The mean increased by 1.07 points, with a 95% confidence interval ranging from -1.24 to -0.89. Thus, these results imply that health education programs successfully enhance students' attitudes toward breast self-examination (BSE).

Table V: Score Before and After Intervention on Attitude of BSE among Teenage Girls (n=60)

	Pre - Intervention	Post- Intervention	t-statistics (df)	p-value
Mean (SD) Score	5.25 (0.60)	6.32 (0.54)	12.05 (59)	**0.001**

*Paired t-test

The Effect of Health Education Programs Toward Practice on BSE Among Teenage Girls in Secondary School

In **Table VI**, the results reveal a statistically significant distinction in the practice scores before (M= 3.70, SD=1.88) and after (M=5.30, SD= 1.60) the implementation of health education programs, t (59) = - 6.73, p = 0. 00. These findings suggest that the health education programs effectively enhance students' engagement in breast self-examination (BSE) practices.

Table VI: Score Before and After Intervention on Practice of BSE among Teenage Girls (n=60)

	Pre - Intervention	Post- Intervention	t-statistics (df)	p-value
Mean (SD) Score	3.70 (1.88)	5.30 (1.60)	6.73 (59)	**0.001**

*Paired t-test

DISCUSSION

Results show a statistically significant increase in knowledge after exposure to health education programs. The results were consistent with Sapkota et al. (18), who found that the significance test demonstrated increased BSE knowledge scores because program intervention was highly significant. The study concluded that educational activities, a motivating technique for enhancing learning and practice in health education, have contributed to increased BSE knowledge. In comparison to pre-evaluation, there was a considerable improvement in BSE knowledge after the educational intervention. The study's findings are also consistent with a survey by Zain et al. (16), which demonstrated that participants in a pre-intervention edifying program needed an adequate understanding of BSE.

The current study findings show that the respondent's knowledge of breast cancer improves after four weeks of attending health education. This recent study is like that of Sarker et al. (20) among female university students in Bangladesh. After the enlightening mediation, they discovered significant changes in acquaintance and alertness about breast cancer and BSE. The findings of this study were also in line with those of Ibitoye and Tshwenegae (15). They evaluated the effect of education on BSE among adolescent girls in a Nigerian school. According to the findings, the respondents' understanding of BSE increased after participating in a health education program. The research backs up the effectiveness of continuous education as a strategy for improving BSE.

This study's findings showed an increased mean attitude among students after the health education intervention program. Therefore, these results suggest that health education programs effectively improve students ' attitudes toward BSE. This significant percentage increase indicates that the intervention programs effectively changed respondents' attitudes and awareness toward BSE. The findings of this study are consistent with Ibitoye and Tshwenegae (15). They demonstrated that the attitude pre-assessment was poor but improved after training. Therefore, the health education program positively improved teenagers' attitudes toward BSE. The present study reported the highest percentage of positive attitudes after intervention: "I will endorse the practice of regular BSE to relatives and friends". The finding of this study is concurrent with another study by Ali et al. (9). The results revealed that, following the intervention program for health education, students' mean attitudes increased. A survey by Khiyali et al. (21) identified a substantial rise in the experimental group's post-test mean score of apparent reimbursements of BSE following the intervention, which is consistent with the findings of this study.

The result is also in line with a study by Rakhsani et

al. (22) and Alsaraireh and Darawad (23), which revealed that before participating in the intervention, participants in the interventional assemblage and the control assemblage had comparatively unfavourable attitudes and harmful practices about breast cancer and BSE. However, when the post-test results were analyzed, it became clear that the intervention group's participants had significantly more positive attitudes than the control group's participants. These findings show the effectiveness of interventions that include respondents and healthcare professionals, which should be considered when developing and accessing such programs. One of the things that can take a very long time to change is a person's attitude because it is based on their core beliefs and level of comprehension.

There is a statistically significant difference between the improvement in practice that occurred before and after the implementation of the health education programmes, according to the findings. This finding supports that health education initiatives can help students practice BSE more frequently. The results of this study are comparable to the survey conducted in North Karachi by Jabeen et al. (24). A comparative study between control groups and intervention also indicated the efficacy of the intervention in the intervention group by ameliorating BSE practices. Contestants strengthened the results in the intervention group executing BSE suggestively more effectively and frequently. Similarly, in a semi-experimental intervention study with a single group, the pretest and post-test study of Kissal and Kartal (25) reported that educational programs based on the Health Believed Model (HBM) provided to the respondents enhanced their HBM scores, breast cancer responsiveness, and BSE abilities. Nevertheless, after six months and a year of training, the frequency of regular BSE continued in relatively low-slung exercise. As was previously indicated, BSE should be performed by women once a month to identify changes in their breasts.

The current findings are congruent with a prior study conducted by Bashirian et al. (26). Their interventional experimentation among Iranian working women revealed a statistically significant difference in breast self-examination performance between the intervention and control sets. Thus, to encourage a substantially higher number of women to perform BSE as part of breast cancer screening, healthcare organisers must help develop and execute this successful intervention.

Numerous studies have shown that educating people about breast cancer and teaching them the proper BSE techniques improves BSE practice. The present findings are consistent with other research by Calderon et al. (27), where it was shown that after six months of intervention, the number of responders practicing BSE has grown, and the frequency of BSE practice has also increased. This substantial rise suggests that the educational interventions that have been carried out have been successful.

CONCLUSION

These findings have implications for the design of health education campaigns for young people, notably teenage girls, on breast cancer and BSE to improve their knowledge, outlook, and BSE practice. Nevertheless, educational intervention ought to be sustained because an enlarged knowledge level is essential to change behaviors about the initial diagnosis of breast cancer. This study posits that the health education program on BSE has effectively improved the KAP levels of teenage girls. Suppose a comparative analysis is undertaken in several other Malaysian states. In such an instance, the ministry might evaluate if secondary school girls need BSE health education to enhance the offerings of school health units. Secondary school girls must participate in a BSE education programme to increase early breast cancer prevention knowledge. Giving this demographic early knowledge could eventually help lower the number of cases of breast cancer discovered in its advanced stages, which would lower mortality.

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