

Effect of a Designed Educational Program on Blind Women's Knowledge Regarding Breast Self-Examination

Doaa Abdel Nasser Mahmoud Mohamed ¹, Aziza Tosson Labib ² and Amal Fatthy Mohamed Ahmed ³

¹ Maternal and Neonatal Health Nursing, Faculty of Nursing, Ain Shams University, Cairo, Egypt.
Dr.doaa.abd.elnaser.mahmoud@nursing.asu.edu.eg

² Maternal and Neonatal Health Nursing, Faculty of Nursing, Ain Shams University, Cairo, Egypt.
dr.aziza.labib@nursing.asu.edu.eg

³ Maternal and Neonatal Health Nursing, Faculty of Nursing, Ain Shams University, Cairo, Egypt.
dr.amal.fatthy@nursing.asu.edu.eg
Corresponding author

1- Doaa Abdel Nasser Mahmoud Mohamed

Maternal and Neonatal Health Nursing, Faculty of Nursing, Ain Shams University, Cairo, Egypt.
Dr.doaa.abd.elnaser.mahmoud@nursing.asu.edu.eg

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ABSTRACT:

Aim The study aimed to evaluate the effect of a designed educational program on Blind Women's knowledge regarding breast self-examination. **Methodology** Quasi experimental (pre-post) study design was utilized. 60 blind female was used participated in the study and was conducted at Egyptian Blind Association at 14 Qenawy St, off Sheikh Rayhan St., Abdeen, Cairo, Sample. Results revealed a highly significant improvement in the total level of knowledge regarding breast self-examination among the studied blind women's after the program implementation ($p < 0.001$). preprogram data showed that the majority of participant (88,3%) had a poor level of knowledge which remarkably decreased to 13,4% post program .conversely, the percentage of participant with a very good level significantly rise from only 3,4% before the intervention to 68,3% after the designed educational program .**Conclusion** Based on the study findings, that implementing a designed educational program for blind women s significantly improved their knowledge regarding breast self-examination

Keywords: Blind women's, Breast Self-Examination, Breast cancer, Educational program.

Introduction

Breast Self-Examination (BSE) was a mainstay for decades in breast cancer screening recommendations, is a cost-effective method of early detection of breast cancer, especially in resource developing countries. More than 90% of breast cancer cases can be detected by

women themselves, stressing the importance of breast self-examination as the key breast cancer detection mechanism. Women who do breast self-examination make a significant contribution to the early identification of breast cancer and reduce cancer fatalities [1]. Breast self-examination is a self-inspection of the breasts, initially proposed as an intuitive,

inexpensive, non-invasive, and universally accessible means of promptly identifying early-stage breast neoplasms also consider an early detection tool that uses a combination of physical and visual examinations of the breasts to check for signs and symptoms of breast cancer. Breast self-examination helping females detect breast cancer in its earliest stage by regularly examining how breast normally feels and reporting any breast changes to their health care providers [2]. Breast cancer (BC) has emerged a serious public health issue that affects both developed and developing countries due to its high prevalence and detrimental effects on mortality, morbidity, healthcare costs, and quality of life. In 2022, there were 2.3 million women diagnosed with breast cancer and 670 000 deaths globally. In Egypt, breast cancer is the most common cancer among women in reproductive age. It is the second most common cause of Egyptian cancer mortality with estimated mortality rate around 11% in 2020, when comparing the mortality/incidence rate ratio for breast cancer between Egypt and developed countries, Egypt had approximately double the ratio (41% v 23%) [3]. Blindness significantly impacts individual's ability to navigate the world, shapes personal experiences, affects independence, social interactions, and access to information. Blind women face difficulties in accessing health care services which prevents them from benefiting from preventive health care. Despite evidence that vision loss increases the risk of mortality and morbidity from other chronic conditions and related injuries, eye and vision health is not recognized as a population health priority, so public health action has been extremely limited [4]. Blindness is a significant public health problem that affects health, economic status, psychological well-being, productivity, and social and academic performance. Globally, at least 2.2 billion people have near or distance vision impairment, and at least 1 billion of these cases could have been prevented or have not yet been addressed [5]. Blind

women often have limited knowledge about breast self-examination (BSE) despite its importance for early detection of breast cancer. Recent studies indicate that gaps in knowledge among blind women include insufficient understanding of the purpose of BSE, lack of awareness of the correct timing and steps of the examination, and limited access to breast health information in accessible formats. The absence of vision-adapted educational materials and inadequate health education from healthcare providers further contribute to poor knowledge levels. These knowledge deficits may reduce women's confidence in breast health awareness and delay early recognition of breast abnormalities, highlighting the need for structured, disability-specific educational interventions targeting blind women's knowledge of BSE [6]. Educational programs have been shown to significantly improve knowledge about breast self-examination (BSE) among blind women. A recent quasi-experimental study conducted with blind women demonstrated a statistically significant increase in total knowledge scores after implementing a structured educational program based on the Health Belief Model. The findings indicated that participants' understanding of the purpose, key steps, and importance of BSE improved markedly in post-program assessments compared to pre-program levels, highlighting that tailored health education can effectively increase awareness and correct misconceptions among blind women. Such improvements in knowledge are critical, it empowers blind women to recognize breast changes and seek timely medical evaluation, thereby enhanced breast health outcomes [7].

Maternity health Nurses are the milestone of public health they play a unique role in alerting the blind women to the early detection of breast cancer, uses their knowledge with health care services to educate them about available breast cancer screening services [8]. Maternity health nurses contribute significantly to providing

counseling and health education for blind women, addressing their general and reproductive health needs. They act as caregivers, educators, and advocates, adapting health information into accessible formats. Nurses teach essential self-care practices, promote health awareness, and empower blind women to make informed decisions also provide tailored education helps blind women overcome barriers such as inaccessible information, social stigma, and limited autonomy. These interventions improve knowledge, confidence, and independent health management, nurses coordinate with healthcare providers and families to ensure a supportive environment and enhance equitable access to care. These efforts support early detection of health issues, promote self-care, and improve quality of life [9]

Materials and methods

Quasi experimental (pre-post) study design was utilized to Evaluate the effect of educational program on blind women's knowledge regarding breast self-examination.

Quasi experiment is an empirical intervention design used to estimate the causal impact of an intervention on target population and establish a cause-and-effect relationship between an independent and dependent variable it is similar to true experimental design except that it lacks one of the key properties of true experimental design such as randomization or control group, so it is most commonly used in nursing research. Inclusion criteria included hereditary blind females, reproductive Age group (25-45yrs) and have a mobile with what's App Application. Exclusion criteria included Blind female with hearing impairment blind female with hands disability and blind females who have previous education on breast self-examination. Participants were recruited using a random sample composed of 60 blind females participated in the study during their visits to Egyptian Blind Association. Efforts were made to include blind females from various socioeconomic backgrounds. The

researcher conducted individual interviews with each blind female at the clinic and personally completed the questionnaire based on the participants' responses during the interviews. The questionnaire consists of three parts that include: one, assessing health history of blind women, two, assessing blind female' knowledge and three, reported supportive materials.

Data Collection:

Upon obtaining formal authorization to conduct the research, the principal investigator met with the Association director to acquire institutional permission and coordinate a suitable schedule for data gathering. The fieldwork phase commenced in July 2025 and continued through the end of September 2025. Data collected over a period of 3 months, during which the investigator was present at the research site two days per week (Sundays and Wednesdays) from 10:00 a.m. to 3:00 p.m. during the morning shift to conduct data gathering. The researcher began by introducing herself to each caregiver subsequently provided them with a comprehensive research background. The researcher clarified the purpose of the research and outlined the expected outcomes to each blind female individually. The researcher was interviewed with each blind female individually and was filling the questionnaire to assess their knowledge about breast self-examination. Researcher took 5-10 minutes to complete the questionnaire sheet for each blind female.

Tools of data collection:

Tool I: A structured interviewing questionnaire

It was developed by the researcher after reviewing the related literature [10]. and reviewed by supervisors it was written in the Arabic language for gathering data. It consists of 12 multiple choices closed ended questions, it divided into two parts: **Part I:** female general characteristics such as (age, residence education. Occupation, marital

status). (1-5 closed ended question) **Part II:** It was designed to assess health history it consists of (7 closed ended question) includes the following: Family history of breast problems as (a family member who has breast problems?) (Question 6 - 12)

Tool :II Female knowledge assessment questionnaire (pre-post):

It was adapted from [11] and modified by the researcher to assess female knowledge regarding breast self-examination it included 8 closed ended question covering knowledge about concept of breast self-examination, importance, time for doing the exam, most common method used when examining the breast by hand, natural changes that occur to the breast as a result of aging process, abnormal changes detected during the breast self-examination that require urgent medical examination)

Scoring system

Adapted from Mohamed (2016) and modified by the researcher; for knowledge outcomes Each question will take score (0) for incorrect response and (1) for correct response. With a total score ranging from (0-8) scores were converted into percentages and categorized as follows:

- poor knowledge if score <50% (score <4).
- Good knowledge 50-74% (score 4-5).
- very good knowledge 75-100% (score 6-8).

Tool III: Supportive materials

1-Booklet in braille text with Arabic language designed by the researcher: It consists of simple and brief information about concept of breast self-examination, the objectives and importance of breast self-examination, time for doing the exam, knowledge regarding the steps of breast self-examination, normal physiological changes in breast related to aging process, abnormal changes in breast require urgent medical examination.

2-Voice record was sent through what's app mobile application

It was developed by the researcher and revised by supervisors; it consists of concept of breast self-examination, the objectives and importance of breast self-examination, time for doing the exam, knowledge regarding the steps of breast self-examination, normal physiological changes in breast related to aging process, abnormal changes in breast require urgent medical examination. It was helpful for the participant to be used at home for revision.

Data analysis:

Following the completion of data collection, the gathered data were systematically organized, tabulated, and subjected to statistical analysis using IBM SPSS Statistics software, version 22. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were employed to summarize the data. Categorical variables were analyzed using the Chi-square (χ^2) test to determine relationships. For continuous variables, the Pearson correlation coefficient (r) was utilized to examine the relationships between variables. The level of statistical significance was determined based on the p-value: a p-value less than 0.05 was considered statistically significant, a p-value less than 0.001 was regarded as highly statistically significant, and a p-value greater than 0.05 indicated no statistical significance.

Ethical approval

Approval for conducting the study was obtained from the Scientific Ethical Research Committee at the Faculty of Nursing, Ain Shams University (26.04.1228) prior to initiating data collection. The researcher provided all participating blind female with a clear explanation of the study's aims and objectives before the commencement of data gathering. Written informed consent was secured from each blind female before their enrollment in the study. Confidentiality of all collected data was strictly maintained, with assurances that information would be used

solely for research purposes. The researcher committed to preserving both anonymity and confidentiality of participant information throughout the study. Additionally, caregivers were informed of their right to withdraw from the study at any point without facing any consequences.

Results

In the results of the study, we note 68.3% of the studied blind females were in age >35-45 years with mean age 37.83 ± 4.65 years **See Table 1**, 45% of the participating children were aged between $1 < 6$ years with mean $\pm$ SD age 6.83 ± 2.06 and 63.3% of them were males **See Table 2**. 75.0% of the studied blind females had no family history of breast problem. While 25.0% of them had family history breast problem where mothers

constituted the highest percentage 53.3% of them and tumors were the most common type of breast problem among 86.7% of them. **See Table 3**, There was a significant statistical difference between pre and post intervention regarding total level of knowledge about breast self-examination at $p\text{-value} < 0.00$. **See Table 4**. There was no statistically significant relation between total level of knowledge related breast self-examination and general characteristics of the studied blind females pre program at $P > 0.05$. while there was a statistically significant relation between total level of knowledge related breast self-examination and marital status and educational level among the studied blind females immediate post program at $P = 0.043$ and 0.051 respectively.

Table 1 Frequency and percentage distribution of the studied blind females according to their general characteristics (n=60).

Variables	N	%
Age (in years)		
25-35	19	31.7%
>35-45	41	68.3%
Mean $\pm$ SD	37.83 ± 4.65	
Residence		
Rural	5	8.3%
Urban	55	91.7%
Marital Status		
Single	19	31.7%
Married	30	50.0%
Widowed	5	8.3%
Divorced	6	10.0%
Educational Level		
Read & write	5	8.3%
Primary	5	8.3%
Preparatory	4	6.7%
Secondary	13	21.7%
Higher Education	33	55.0%
Occupation		
House wife	39	65.0%
Work	21	35.0%

Table 2: Frequency and percentage distribution of the studied of the studied blind females according to their family history (n=60).

Items	No.	%
Family history breast problem		
Yes	15	25.0%
No	45	75.0%
If yes, the relation of family member (n=15)		
Mother	8	53.3
Sister	4	
Maternal Aunt	2	13.3
Paternal Aunt	1	6.7
If yes, type of breast problem (n=15)		
Tumors	13	86.7%
Breast lumps	2	13.3%

Table 3: Frequency distribution of the studied blind females according to their total level of knowledge about breast self-examination pre and post designed training program (n=60).

Total level of knowledge	Pre-program (n=60)		Post program (n=60)		MH test	
	N	%	N	%	Test	P-value
Poor	53	88.3	8	13.4	5,334	<0.001 *
Good	5	8.3	11	18.3		
Very good	2	3.4	41	68.3		

Table 4 Relationship between general characteristics of the studied blind females and their total level of knowledge pre and post program (n=60).

Demographic characteristics		Total level of knowledge													
		Pre-program						X ² & P-value	Post-program						X ² & P-value
		Poor		Good		Very good	Poor		Good		Very good				
		N	%	N	%		N		%	N		%	N	%	
Age (in years)	25-34 Years	1 8	30. 0	 1	1. 7	 0	0. 0	1.370 & 0.504	 3	5. 0	 3	5. 0	1 3	21. 7	0.224 & 0.894
	35-45 Years	3 5	58. 3	 4	6. 7	 2	3. 3		 5	8. 3	 8	13 .3	2 8	46. 7	
Residence	Rural	 4	 6.7	 1	1. 7	 0	0. 0	1.116 & 0.572	 1	1. 7	 2	3. 3	 2	3.3	2.219 & 0.330
	Urban	4 9	81. 6	 4	6. 7	 2	3. 3		 7	11 .7	 9	15 .0	3 9	65. 0	
Marital status	Single	1 8	30. 0	 1	1. 7	 0	0. 0	7.725 & 0.259	 3	5. 0	 3	5. 0	1 3	21. 7	13.028 & 0.043*
	Married	2 6	43. 3	 2	3. 3	 2	3. 3		 4	6. 7	 4	6. 7	2 2	36. 7	

	Widowed	5	8.4	0	0	0	0		0	0	0	0	5	8.3	
	Divorced	4	6.7	2	3	0	0		1	7	4	7	1	1.7	
Educational level	Read & write	5	8.2	0	0	0	0	8.347 & 0.400	2	3	1	7	2	3.3	15.129 & 0.051*
	Primary	3	5.0	1	7	1	7		0	0	1	7	4	6.7	
	Preparatory	3	5.0	1	7	0	0		2	3	2	3	0	0.0	
	Secondary	12	20.	0	1	7	0		1	7	3	0	9	0	
	Higher Education	30	50.	0	2	3	1		3	0	4	7	2	43.	
Occupation	House wife	36	60.	0	2	3	1	1.771 & 0.314	7	11	5	8.	2	45.	3.641 & 0.162
	Work	17	28.	3	3	0	1		1	7	6	10	1	23.	

Discussion

The present study aimed to evaluate the effect of designed training program for blind females on mastering breast self-examination. The findings of the recent study showed that more than two third of the studied blind females were in age >35-45 years with mean age 37.83 ± 4.65 years. These results were in the same line with Aval, et al [12] who reported that mean age of samples (36.84 ± 9.8) in their study. From the researcher's perspective, this may be due to this age group considered as high risk for developing breast cancer BC bedside there hasn't enough information about BSE also the discrepancy among different study results may be due to methodological variation related to sampling and data collection. The current study revealed that half of the studied blind female were married. This finding was in accordance with Sakr et al [13] who assessed BSE compliance among visually impaired adolescent girls and found that more than one-quarter of girls were married. **From the researcher point of view**, the high percentage of married women in the current study could positively influence their health-seeking behavior. Married women often demonstrate a higher interest in and commitment

to breast health practices, driven by a sense of responsibility toward their families, encouragement from partners, and increased contact with healthcare services during marital and reproductive healthcare visits. Concerning the educational level of the blind female, the current study showed more than one half of the studied blind female had higher education. from the researcher point of view that might be due to blind females who were encouraged and supported by families are more likely to continue education despite barriers and easily access to supportive educational services for female with visual impairment as (Braille materials, assistive technology, inclusive education programs), which helps them continue to university level. This finding was contradicted with Elsayy, et al [14] who reported that 42.9% of women were unable to read and write or had primary education, while 14.2% of them had secondary education.

As for the occupational status of the participants, the findings of the current study indicated that two third of the studied blind females were house wife. this could be due to the study sample were female with the visual impairment so blind female often face limited employment opportunities due to discrimination, lack of

accessible workplaces, inadequate vocational training, and restricted access to education. In many communities, cultural attitudes toward disability and gender may further reduce their chances of participating in the workforce. This result was in the same line with Elsayy, et al [14] who found that all women were doing manual work

Considering residence area of studied blind females, the present study indicated that the majority of them were from urban areas this might be due to increase health services provided in urban area than rural areas. This finding was supported by Mohamed et al who evaluated the effect of structured visual educational sessions on knowledge and practices regarding BSE among adolescents' girls with hearing and speech challenges and found that nearly two-thirds were from urban areas. Concerning the family history of studied blind females, the current study revealed that one quarter of the studied blind females had positive family history of breast problem, and more than half of them reported that their mothers were the affected relatives in their family. This might be due to maternal history is considered a significant risk factor for developing breast diseases, especially breast cancer. This result was in agreement with another study by Seifu & Mekonen [15] which reported that one third of the study sample were mentioned that they had breast cancer in their family, which was consistent with the findings of a previous stud

Furthermore, the current study showed that the majority of studied blind female reported that tumors were the most common type of breast problem among affected family members. This might be indicating Family history is a major risk factor for breast cancer; approximately 5–10% cases of breast cancer are associated with a family history. This finding was in the same line with *Liu, et al [16]* in research article entitled “Correlation between family history and characteristics of breast cancer” which mentioned that, there was the link between family history and breast cancer features to elucidate the importance of family history in the diagnosis and treatment of breast cancer

Concerning studied blind females' total level of knowledge regarding breast self-examination pre and post designed training program. the current study showed that only (3,4%) of the studied blind female had very good level of knowledge pre training program which improved to be the majority of them had good and very good (18,3 and 68,3% respectively) in post program implementation with a significant statistical difference between pre and post intervention regarding all items of knowledge about breast self-examination at $p\text{-value} < 0.001$. That might be attributed to the use of specialized teaching strategies adapted to the needs of blind females, including brille booklet, verbal explanation, repetition, and voice record. Therefore, adapting educational content to sensory abilities other than vision appears to play a critical role in enhancing comprehension and retention of information. Similarly, two previous studies. Firstly, Elsayy et al [14] who found that the majority of the adolescent girls had satisfactory level of knowledge in immediate posttest and follow up compared to fewest percentages of them in the pretest. A statistically significant difference was found between adolescents' total knowledge scores regarding all aspects of reproductive health (puberty, menstruation, nutrition, and exercise) in pre, immediate posttest, and follow up with ($f=277.1, p=0.0001$). That might be attributed to training program significantly improved levels of studied blind females' knowledge regarding breast self-examination

Secondly, Padmaja et al [17] assessed the effectiveness of the awareness program on knowledge regarding breast cancer and practice on breast self-examination among rural women in Chittoor dist, Andhra Pradesh, reported that women had adequate knowledge after providing health education and skill training on BSE. Regarding relation between general characteristics and total knowledge pre and post program implementation, the present study indicated there was no statistically significant relation between total level of knowledge related breast self-examination and general characteristics of the studied blind females

preprogram at $P > 0.05$. From the researcher point of view, this might be due to small sample size can contribute to non-significant findings even when slight differences exist. Before the program, the overall level of knowledge may have been generally poor among all participants. When baseline knowledge is uniformly low, differences between demographic groups become minimal and statistically insignificant.

Additionally, these findings might be due to the educational training may have been equally effective among all categories of studied blind females. The absence of statistically significant differences after the intervention indicates that the training program succeeded in delivering knowledge uniformly to the blind females. This result was in the same line with Yilmaz et al [18] showed there wasn't a relationship between age and residence with a total score of knowledge in pre & post-educational programs.

While there was a statistically significant relation between total level of knowledge related breast self-examination and marital status and educational level among the studied blind females immediate post program at $P = 0.043$ and 0.051 respectively from the researcher point of view, blind females with higher educational levels are often more capable of comprehending the educational content, asking questions, and applying the instructions provided during the program. Also, married women may perceive a greater responsibility toward maintaining their health for family stability, making them more motivated to learn and practice BSE, additionally, It is possible that this is linked to women's academic achievement, which might assist them in gaining knowledge about breast self-examination. The current study in the same line with M Goda et al [19] who reported that there was statistical significant effect before and after the program implementation regarding studied girls' knowledge in relation to level of education and occupation p -values = 0.000 , 0.000 , 0.002 , 0.001 respectively.

Implication

This study emphasizes the importance of designed educational program on blind women's

knowledge regarding breast self-examination. By strengthening blind women's knowledge and reported practices, designed educational interventions can enhance to help them acquiring knowledge regarding breast self-examination and keeping them familiar with their breast appearance and feels this will help in identify and detect any breast abnormalities, also reduce incidence of breast cancer and decrease its morbidity and mortality rates, also involving them in the research process will promote their feeling of independency and improve their sense of identity.

Conclusion

According to the findings of the current study, The present study concluded that implementing a designed educational program for blind women significantly improved their knowledge regarding breast self-examination.

Recommendations

In the light of the findings of this study, the following recommendations are proposed: Continuous educational and training programs tailored for blind females should be implemented to improve awareness about Breast Self-Examination. Educational materials should be provided in accessible formats such as Braille and audio-based instructions. Further studies are recommended on larger samples and in different settings to generalize the finding

Abbreviation

BSE: Breast Self Examination

BC: Breast Cancer

Author contribution

D. A. N, A. T. L and A. F.M participated in writing and data analysis. All authors participated in all steps of the study.

Funding Declaration

No funding was received for this study

Data Availability

Data available in manuscript

Ethics approval and consent to participate

Approval for conducting the study was obtained from the Scientific Ethical Research Committee at the Faculty of Nursing, Ain Shams University with code (24.12.1228) prior to initiating data collection. The researcher provided all participating blind female with a clear explanation of the study's aims and objectives before the commencement of data gathering. Written informed consent was secured from each caregiver before their enrollment in the study.

Ethics Accordance

The research was conducted in accordance with the Declaration of Helsinki and Belmont Report.

Consent for publication

Not applicable

Clinical trial number

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Competing interests

The authors declare no competing interests.

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