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BREAST CANCER KNOWLEDGE AND RISK AWARENESS AMONG NURSES: EVIDENCE FROM A TEACHING HOSPITAL IN LAHORE, PAKISTAN

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Abstract

Breast cancer is the most prevalent cancer among women worldwide, and nurses play a crucial role in promoting early detection through patient education. This cross-sectional study assessed breast cancer risk factor knowledge among 609 registered female nurses at Jinnah Hospital, Lahore, using stratified random sampling and a structured questionnaire based on Stager's Comprehensive Breast Cancer Knowledge Test. Knowledge levels were categorized as good, fair, or poor. Ordinal regression identified significant predictors of knowledge: nurses from private institutions (aOR = 4.23), those with experience caring for breast cancer patients (aOR = 1.41), those who had received a breast exam (aOR = 1.56), and those who had performed breast exams (aOR = 1.87) were more likely to have good knowledge. Only 35% of nurses demonstrated good knowledge. The findings emphasize the need to strengthen breast cancer education in nursing curricula and provide ongoing clinical training to improve early detection and patient care.

INTRODUCTION

Globally, breast cancer is the most common cancer among women. The African and Asian countries showed an increasing annual incidence rate than the European and North American countries. Furthermore, Pakistan has a higher incidence of the disease than the neighbouring countries (Sung et al., 2021). In Pakistan, breast cancer is noted to metastasize earlier and is more aggressive. Karachi Cancer Registry, the only population based cancer registry in Pakistan, reports breast cancer as the most common cancer (34.6% of cancer cases) among females. The age-standardized incidence rate (to the world population) was 69.1 per 100,000 averaged over the years 1998–2002, the highest recorded rate of breast cancer in Asia (Yousaf et al., 2012). Similarly in Multan, another major city of Pakistan, breast cancer was the most common female cancer (Amin et al., 2020).

Pakistan faces a high burden of breast cancer disease with late stage presentation being a common feature. It has been seen that more than half of the patients present in advanced stages (stages III and IV) (Qasim et al., 2020). Regular clinical breast examination and mammography of women according to the internationally accepted guidelines can result in down-staging of breast cancer of asymptomatic women. However, there are no national screening programs for breast cancer in Pakistan. In the Pakistani context, educating the women about the risks of breast cancer constitutes a first step towards early detection of breast cancer, so that women would be able to judge their risk and take relevant measures (Abdul Rehman et al., 2024).

The nurses can play an important role in educating women through specially designed educational programs in the clinical setting, as well as, through

community out- reach strategies that suit social and cultural setting. In addition, they constitute an important source of information within their social networks (Shoukat & Shah, 2023). Since the nurses can have a major influence on the behavior of women, they need to be knowledgeable themselves about breast cancer risk factors and the importance of early detection through screening.

Studies in the developing countries show diverse results ranging from poor to good knowledge about breast cancer. Among the Nigerian nurses, about half were well- informed of two out of five risk factors (Pruitt et al., 2020). Sixty percent Iranian nurses correctly identified family history as a risk factor for breast cancer, while smaller proportions knew about other risk factors (Khoramdad et al., 2022). Most of the Jordanian nurses were able to correctly answer the general breast cancer questions which included risk factor questions (Al Qadire et al., 2018).

A hospital-based study in Lahore, Pakistan, reported good levels of knowledge about breast cancer risk factors and screening methods among doctors and nurses. However, the knowledge was not objectively evaluated and hence valid conclusions about the level of breast cancer knowledge among this group cannot be made. The aim of this study was to objectively assess the level of knowledge regarding risk factors of breast cancer and to evaluate factors associated with this knowledge among female registered nurses working in teaching hospital of Lahore.

Research Objective

The objective of this study is to assess the knowledge of breast cancer and its risk factors among registered nurses in teaching hospital in Lahore, Pakistan, and to identify factors that influence this knowledge for improving breast cancer awareness and early detection.

Materials and Methods

Study Participants and Procedure

A cross-sectional survey was conducted between July 2024 and September 2024 in Jinnah Hospital, Lahore, Pakistan. Teaching hospital was defined as hospitals affiliated with a Medical College or School of Nursing and employing at least 50 female registered nurses. The target population included female registered nurses from various departments, with a minimum education requirement of a diploma in general nursing. Nurses with a past or current history of breast cancer were excluded to avoid bias due to their personal experience.

Stratified random sampling was employed, treating each of the 02 hospitals as a stratum. A list of female registered nurses was obtained, and a computer-generated simple random sample was used to select participants. After obtaining informed consent, trained female interviewers conducted structured interviews in the workplace. Each interview lasted about 20 minutes. If a nurse was unavailable, a maximum of three attempts were made to contact her. Data collection in each hospital was completed quickly to prevent contamination, and a breast cancer brochure was distributed to nurses after the survey in each hospital.

The sample size was calculated based on an estimated 50% proportion of nurses having adequate knowledge, with a 95% confidence level and a 3% error margin. Adjusting for a 20% non-response rate, the required sample size was 638 nurses. Using proportional allocation across the two hospitals, a total of 609 nurses were successfully interviewed, resulting in a 95.45% response rate. The high response rate was likely due to the nurses' interest in learning more about breast cancer.

Research Instrument

The knowledge assessment tool comprised five questions from Stager's Comprehensive Breast Cancer Knowledge Test (general knowledge sub-scale) and five additional questions formulated by the principal investigator using local and international literature. The tool's content validity was established by a surgeon and an epidemiologist with expertise in breast cancer, and the reliability was assessed using the Kuder-Richardson 20 (KR-20) for dichotomous responses.

Key knowledge items included family history of breast cancer, late age at first pregnancy, and myths regarding breast cancer development (such as being caused by a curse/evil eye). The scoring ranged from 0 to 15, categorized as follows:

- **Poor knowledge:** Score ≤ 7 (no correct answers to key items)

- **Fair knowledge:** Score 8–10 (correct answer to one key item)
- **Good knowledge:** Score 11–15 (correct answers to two or more key items)

Data Analysis

Demographic information (age, marital status, income, education), work history, personal health history related to the breast, family breast cancer history, self-perceived knowledge, and knowledge sources were also collected. Data were analyzed using descriptive statistics to summarize nurse demographics and knowledge scores. Inferential statistics were employed to assess the relationships between knowledge levels and demographic variables. The study received approval from the Ethical Review Committee of the sample Hospital, and permissions were obtained from the administration of participating hospital to conduct the survey.

Data analysis was carried out using SAS, version 8. Descriptive statistics were performed for the independent variables, including demographic characteristics and work history, as well as the outcome variable—nurses' knowledge of breast cancer risk factors, which was treated as an ordinal variable. The proportions of nurses with "good," "fair," and "poor" knowledge levels were calculated.

To identify the factors associated with the knowledge level, ordinal regression was employed using the cumulative logit model. The ordinal regression analysis was conducted with the 'proc logistic' procedure in SAS. The adequacy of the proportional odds assumption was assessed using the score test.

Results

Table 1: Personal characteristics of female nurses working in Jinnah Hospital, Lahore, Pakistan 2023 (n = 609)

Variables	Numbers (%)	Mean (SD)
Age (years)		32 (8)
Highest nursing education received:		
General nursing diploma	229 (38)	
General nursing diploma & midwifery or General nursing diploma & lady health visitor	274 (45)	
Post-graduation and/or any diploma in any specialty	75 (12)	
Bachelor of science in nursing	31 (5)	
Graduated from a private school of nursing	265 (44)	
Currently working in a private hospital	354 (58)	
Duration of work as a nurse (years)		9 (7)
Ever cared for a breast cancer patient	406 (67)	
Ever performed clinical breast examination on a patient	365 (60)	
Ever undergone a clinical breast examination	386 (63)	
Family history of breast cancer	49 (8)	
Friends/acquaintances history of breast cancer	60 (10)	
Self-perceived knowledge of breast cancer	590 (97)	
Interested in breast cancer education	563 (92)	

The mean age (standard deviation) of female registered nurses in the study's sample was 32 ± 8 years. Eighty three percent of the nurses had received basic level nursing education only including general nursing diploma alone or general nursing diploma with lady health visitor or with midwifery certification. Forty four percent of the nurses in the sample had attended a private school of nursing and 58% were employees of private hospitals at the time of the sur- vey (Table 1).

Table 2. Individual items and respective scores assessing knowledge of breast cancer risk factors with percentage of correct responses

Items	Correct answer	Score	Correct response %
1. Breast cancer is a communicable disease	No	1	99.2
2. The irritation of a tight bra can over time cause breast cancer	No	1	59.4
3. In some women being overweight increases the risk of developing breast cancer	Yes	1	27.6
4. A woman who bears her first child after the age of 30 years is more likely to develop breast cancer*	Yes	3	50.2
5. Use of oral contraceptives increase a woman's risk of breast cancer	Yes	1	49.6
6. A hard blow to the breast may cause breast cancer later in life	No	1	24.6
7. Most breast lumps are cancerous	No	1	73.7
8. A woman, who has a first blood relative with breast cancer, is at higher risk of developing breast cancer*	Yes	3	57.8
9. Breast feeding increases the chance of breast cancer	No	1	96.4
10. Breast cancer can be a result of a curse/evil eye*	No	2	94.9
Total		**15**	

Thirty five percent of the nurses in the study's sample had good knowledge, 40% had fair knowledge while 25% nurses had poor knowledge of breast cancer risk factors. The reliability coefficient (KR-20) for the tool was 0.1 which is considered quite low.

Ninety-nine percent of the nurses in the sample correctly identified breast cancer as a non-communicable disease, 96% knew that breast feeding is not causative of breast cancer and 95% answered that evil eye has nothing to do with breast cancer. However, only about 28% of the nurses knew that in some women being overweight increases the risk of developing breast cancer (Table 2).

Table 3: Multivariable ordinal regression model for factors associated with good knowledge of breast cancer risk factors:

Variables	Adjusted Odds Ratio	95 % Confidence Interval of Odds Ratio
School of nursing:		
Public(reference)	1	
Private	4.23	2.93, 6.10
Undergone a breast examination:		
Not undergone(reference)	1	
Undergone	1.56	1.08, 2.26
Performed breast examination on a patient:		
Not done(reference)	1	
Done	1.87	1.34, 2.61
Cared for a breast cancer patient:		
No(reference)	1	
Yes	1.41	1.00, 1.99

Chi-square test statistic for score test = 2.36; p-value = 0.67

Chi-square test statistic for Likelihood ratio test = 146.64; p-value < 0.0001

The proportional odds assumption for the ordinal regression analysis (cumulative-logit model) was satisfied (p- value = 0.69). Adjusting for other variables present in the final model (Table 3), nurses graduating from a private school of nursing were more likely to have good risk factor knowledge (aOR = 4.23; 95% CI: 2.93, 6.10) compared to nurses graduating from a public school of nursing. The odds of good risk factor knowledge were higher if the nurse had received a clinical breast examination (CBE) in the past (aOR = 1.56; 95% CI: 1.08, 2.26). Similarly a nurse was more likely to have good knowledge of risk fac- tors if she had performed a breast examination (CBE) on a patient (aOR = 1.87; 95% CI: 1.34, 2.61). Ever having cared for a breast cancer patient was also associated with good risk factor knowledge (aOR = 1.41; 95% CI: 1.00, 1.99).

Discussion

This study estimated that 35% of registered nurses in the teaching hospital of Lahore had good knowledge of breast cancer risk factors. Nurses who graduated from a private nursing school or who have had professional breast cancer experience were more likely to have good knowledge. The knowledge of breast cancer risk factors among the nurses of Lahore is low and is similar to that seen in other developing countries (Sung et al., 2021). This study sample comprised of a random mix of nurses working in various units of public hospitals, who did not differ in their knowledge level. It is conceivable that risk factor knowledge is mostly acquired during classroom teaching compared to exposure at the workplace. The health care professionals work with patients so they are mainly exposed to symptoms and signs of disease and to treatment outcomes rather than to the development process of the disease especially for non-communicable diseases such as cancer (Rahman et al., 2019). The low level of risk factor knowledge among nurses in the developing countries is suggestive of insufficient emphasis on the importance of primary prevention in the nursing curricula. In spite of rigorous efforts towards improving medical education in the developed countries, it has been realized that healthcare professionals including nurses are not adequately educated about cancer risk factors, risk assessment and cancer prevention (Shoukat & Shah, 2023).

Breast cancer risk factor knowledge among nurses is important so that they can provide appropriate screening recommendations to women with a high risk profile, especially in the Pakistani context where breast cancer screening is not a national phenomenon (Imran et al., 2018).

Nurses graduating from the private school of nursing were about 4 times more likely to have good knowledge of risk factors of breast cancer compared to nurses graduating from public school of nursing, implying relatively better educational standards of private schools of nursing. This finding is supported by the fact that some private institutions in Pakistan have instituted post-basic nursing education beyond the diploma level while the government sector does not have such programs (Khoramdad et al., 2022). However, at the diploma level the length of the educational process is similar in both the private and public institutions indicating a difference in the quality of education. This is an area which requires further research (S. Qasim et al., 2020).

A nurse who had cared for a breast cancer patient or had performed clinical breast examination (CBE) on a patient during her nursing career was better informed of breast cancer risk factors. The association with workplace expo- sure seems to be consistent with the general opinion of nurses in Manchester, England who identified 'nursing patients' as the most important source of cancer information (Moodley et al., 2018).

The study indicates that a nurse who had ever received a breast examination by a health-care professional was more knowledgeable about breast cancer risk factors. Among nurses employed in the Public Health Service in Singapore, breast cancer risk factor and screening knowledge was not associated with receiving a clinical breast examination in the past year (Sarker et al., 2022). In the study, the breast examination was done as part of the general examination at the start of employment or of antenatal checkup for most of the nurses and it could be that the nurse was informed by the health care provider about the risk factors of breast cancer during the examination process. There is a need to assess the breast cancer counseling practices of health care providers (Ali et al., 2022).

One of the private hospitals which were initially selected for the study turned down request for the survey. It is unlikely that the study's results may have been affected by the exclusion of these nurses because we had similar representation from the private institutions included in this study in terms of the health services offered, the recruitment of nurses, academic activities and the catchment population (Migliavaca et al., 2022).

The questionnaire for this study was adapted from a validated questionnaire after modification. Content validity was established through peer review (Irfan et al., 2021). In addition, construct validity of the scale was evident by the plausible association of professional breast cancer experience with knowledge of breast cancer risk factors. The reliability coefficient (KR-20) of the instrument was unsatisfactorily low. Internal consistency reliability of General Knowledge sub-scale of the Stager's Comprehensive Breast Cancer Knowledge Test was 0.6 [20], but reliability coefficient of study's tool cannot be directly compared with this as we have modified the tool. In addition, the low reliability for the present study could be indicative of the vast differences that exist among women in USA, where the Stager's tool was validated, and the Pakistani nurses. Also Stager's General Knowledge sub-scale was adapted for a survey among Jordanian nurses (Begum & Khan, 2023) and a low reliability coefficient of 0.26 was reported. The study's tool needs to be revised in a reliability study to improve the internal consistency.

Conclusion

Based on these results, we came to the following conclusions:

- The level of good knowledge of breast cancer risk factors among female registered nurses working in teaching hospital of Lahore was low (35%). The private affiliation of school of nursing and ever having cared for a breast cancer patient had a positive influence on the knowledge of risk factors.
- There is a need to improve breast cancer content in the nursing curriculum. As the implementation of the revised curriculum may take some time, workplace training courses for the nurses can be introduced relatively earlier. It is also important to encourage the nurses to disseminate this knowledge effectively and appropriately within the general population.
- Similar studies among health professionals in other parts of Pakistan could provide evidence that will facilitate a better understanding of the level of awareness of breast cancer within the Pakistani health community.

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