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ORIGINAL ARTICLE

Breast Cancer Awareness and Knowledge Among Undergraduate Students of the University of Home Economics, Lahore, Pakistan: A Cross-Sectional Study

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ABSTRACT

Background: Breast cancer is an important public health issue and one of the most frequently diagnosed cancers in the world in women. It is crucial to know its risk factors, warning signs and early detection signs to promote early healthcare-seeking behaviour. Despite the availability of the health information, women, even University students have some gaps and misconceptions regarding breast cancer in Pakistan.

Objective: To determine level of awareness and knowledge about breast cancer amongst female undergraduate students of the University of Home Economics, Lahore, Pakistan and investigate the sources, attitudes, related practices, perceived barriers and link between the academic years and the knowledge.

Methods: The study was designed as quantitative descriptive cross-sectional study in context of female undergraduate students of University of Home Economics, Lahore. A sample size of 300 students was proposed and convenience sampling method was applied for the recruitment of the participants. The purpose of the questionnaire, which was structured, self-administered and assessed, was to gather data on the sociodemographic characteristics, general awareness, sources of information, knowledge on breast cancer risk factors, warning signs, attitudes, practices and perceived barriers. Data analysis was done by SPSS 26.0. The frequencies of the participants' answers were summarised using descriptive statistics and the chi-square test was suggested to test associations between academic year and knowledge categories. A value of $p < 0.05$ was considered statistically significant.

Results: Results showed many participants had a general awareness of breast cancer; however, differences existed in the level of knowledge of breast cancer risk factors, warning signs, and associated health practices. There were some important potential sources of breast cancer information identified, such as social media and online platforms. Potential barriers were also identified and included a lack of information, embarrassment, fear and access to information.

Conclusion: Breast cancer awareness, among the undergraduate students, must go beyond recognising breast cancer to correct knowledge of known risk factors, warning signs, and recommended health care-seeking behaviours. Practical education programmes at the University, experts' awareness raising, and credible digital health information can be effective in addressing gaps in knowledge and encouraging health-informed choices and decisions among young women.

Keywords: Breast Cancer; Awareness; Knowledge; Undergraduates; Health Literacy; Early Detection; Pakistan; Cross-Sectional Study.

INTRODUCTION

According to various health statistics, breast cancer is one of the most common forms of cancer diagnosed in the world and is a major public health problem, with a large burden of incidence, mortality and socio-economic issues. It is characterized by the uncontrolled growth of certain abnormal cells in the breast tissues, which may spread to other organs within the breast or to other organs of the

body. Approximately 1 in 4 individuals (females) see a breast cancer diagnosis. Roughly 2.3 million women were detected with breast cancer in the world in 2022 and approximately 670,000 women died from the cancer of a female breast[1,2].

With new diagnostic and therapeutic options, the prognosis for breast cancer has improved; however, timely and timely diagnosis, coupled with providing access to adequate health-care services, play a significant role in the efficacy of breast cancer management. Breast cancer awareness along with health education are a crucial part of strategies that can help reduce diagnostic delay (DD) and enhance women's health outcomes.

Timed presentation and treatment of breast cancer in LMICs is a cause for concern, owing to a lack of healthcare services to the breast, poor infrastructure to provide diagnostic services at the time of discovery, financial limitation, and lack of public awareness. This is one of the country's with a high incidence of breast cancer. Breast cancer is one of the most common cancers among women in Pakistan with need of enhanced awareness, early detection, and right behavior towards health service utilization[2,3].

Breast cancer awareness is about becoming knowledgeable of the cancer and its potential predispositions and dangers, in addition recognizing when to contact a medical professional to get help. The most significant risk factors are age, family history, genetic mutations that need to be passed on, previous breast cancer, some reproductive or hormonal aspects, obesity and alcohol consumption[1]. Note that the following symptoms are not necessarily signs of breast cancer, but any unusual changes should be assessed appropriately in a clinical setting. These signs are important to recognize and may help promote timely health care-seeking and decrease the chances of a delay in diagnosis[1,4].

Results suggest that Pakistan has high level of gaps in the knowledge about breast cancer. Hussain et al. found that the female university students of the nation showed low awareness level of risk factors, symptoms and examination practices of breast cancer in a national cross-sectional survey with 774 randomly selected female students. Awareness of a history of breast cancer in first-degree relatives as a risk factor was confined to only 29.8% of participants and several clinical risk factors were not known[3]. Study estimates showed that about 42.7% of the participants had the knowledge of risk factors while about 41.8% had the knowledge of symptoms[4]. Promoting awareness of the breast and timely clinical assessment of abnormal breast changes should be encouraged by appropriate health education. Breast self-awareness is not a substitute for routine screening mammography or recommending screening for young women unless they are at risk or meet screening guidelines[1].

This study aims to measure breast cancer awareness, breast cancer knowledge among female undergraduate student of University of Home Economics, Lahore, Pakistan. The specific objectives of this study were to assess students' general awareness of breast cancer, determine what resources they rely on when learning about the disease, determine what they know about common breast cancer risk factors and warning signs and determine their attitudes towards breast health and how they view their barriers in trying to obtain reliable information and appropriate healthcare. In addition, the authors explored the relationship between sociodemographic and academic variables (such as academic year) and breast cancer knowledge levels. The results are likely to lead to the identification of key knowledge gaps and evidence to guide the development of targeted awareness campaigns, educational programmes and health information campaigns targeted to students at universities.

METHODOLOGY

Research Design: This study used the quantitative research design approach, descriptive, cross sectional with the aim to evaluate breast cancer awareness, knowledge, attitudes, and practices among under graduate students of University of Home Economics, Lahore, Pakistan. A cross-sectional research design was found to be appropriate as it involves collecting information around a specified time with a defined group of participants, regarding the information they possess on breast cancer and how they feel about it and how they act in relation to it.

The research aimed to find out how much students in the undergraduate category knew about breast cancer, their awareness of breast cancer recognized risk factors and warning signs, and their knowledge of early detection and appropriate practice of seeking health care. Additionally, the study identified sources of information used to obtain breast cancer knowledge along with potential barriers that could impact breast health information and health care services use.

Study Setting: The study was carried out in the University of Home Economics (UHE), Lahore, Punjab, Pakistan. The study situation selected was the university, since it offers undergraduate studies on various academic fields and an adequate institutional context for study of health awareness and knowledge of students of university.

This study had undergraduate students taken from various departments based on the year in school. The current study was an endeavour to determine if differences existed among the students who serve on this university's

educational levels and types when it came to breast cancer awareness and knowledge. Data collection took place on the University campus and via an approved online questionnaire based on the choice of data collection method and institutional approval.

Study Population: The target population was the female undergraduate students of University of Home Economics (UHEL), Lahore, during the period of data collection. The reason for selecting female students (under-graduate) was because the study was centred on breast cancer awareness and breast health knowledge, which were specially narrowed down to young women. Students of various academic departments and academic levels were included to ensure a spectrum of awareness and knowledge that would help to develop a whole student understanding. The students who were available on the collection date, satisfied with inclusion criteria and willing to complete the study were included in the accessible population.

Sample Size Determination: The sample size to be used in the study is 300 undergraduate students. The purpose of the sample size was to give enough observations to describe the awareness and knowledge of the breast cancer and to test the associations between some demographic characteristics and the aspects of breast cancer of which knowledge was examined.

As the possibility of non-response has been checked, the number of people targeted can be further increased. If the actual study has fewer than 300 subjects, however, then this would be the achieved or planned sample size and not the satisfaction of the above calculation.

Sampling Technique: The approach to draw participants was suggested to be a non-probability type of convenience sampling technique. The non-probability sampling technique of convenience was proposed for sampling participants. This approach identifies potential respondents that can be reached, they are available, and they are willing to answer the questions for a given time period during data collection.

The researcher recruited students who were taking undergraduate classes from various departments of study and different years of study to get these students to participate and receive responses from different kinds of students. The participants who met the criteria were informed about the nature of this study, its aim and voluntary participation.

Convenience sampling may be somewhat easily applied and be economical for university research, but may be subject to selection bias due to the lack of random selection process. Therefore, the results must be taken with a pinch of salt and cannot be unequivocally extended to general public of undergraduate students of Lahore or Pakistan.

Inclusion Criteria: To be included, participants had to have been referred by a health care provider and have a diagnosis of autism or significant intellectual disability and/or other developmental delays.

- Female Undergraduates presently enrolled in the University of Home Economics at Lahore.
- Students on any academic department or undergraduate programme.
- All students in all undergraduate classes.
- Students available for data collection period.
- Students who volunteered to participate.
- Students who gave informed consent prior to questionnaire completion.

Exclusion Criteria: The following people were not included in this study:

- Male Students and Non- Undergraduate students.
- Postgraduate degree holders (BS and MPhil students)
- Students who were not studying at the University of Home Economics in the study period.
- Persons refusing to participate or giving an inadequate informed consent.
- Questionnaires that had large amounts of missing data or forms that were largely incomplete to be used for statistical analysis.

The survey instrument and questionnaire development are performed.

A structured, self-administered questionnaire was used to gather data of the students using the questionnaire that will evaluate breast cancer awareness, BC knowledge, attitude, and practice among the students of the under-graduate level school.

Data for designing the questionnaire was obtained by referring to published literature pertaining to the breast cancer awareness and knowledge among the university students and especially with that of Pakistan and in similar settings. The instrument had five major sections which corresponded to the study objectives and to the tables of statistics.

Part 1: Sociodemographic characteristics.: The first was designed to gather data on demographic and educational characteristics of participants. The variables included:

- Age.
- Academic year.
- Department/Academic Discipline
- Marital status.
- History of breast cancer in the kindred.

These variables are introduced to explain the demographic features of the study groups and investigate the possible association between these variables and breast cancer awareness and awareness, respectively.

The questions covered: Pre-existing knowledge of breast cancer.

- Knowledge of the disease.
- Information on breast cancer sources.
- Awareness or awareness from breast cancer awareness activities.
- Knowledge of the need for early identification and assessment.

Social media, TV, newspapers, websites, health care providers, schools, families, and friends were all potential sources of information.

Knowledge of Risk Factors, Signs and Symptoms (cumulative throughout answer book)

The third section surveyed participants on the knowledge of common risk factors and warning signs for breast cancer.

Data Collection Procedure: Planning of data collection was done after approval from concerned institutional authorities and relevant research ethics committee. The researcher contacted eligible undergraduate students and used a verbal invitation to explain the purpose of the study, nature of taking part and expected time for completing a questionnaire. Participants were told that participation would be voluntary and that participation but not completing responses would have no academic or other consequences to their academic grade or future. Informed consent was obtained and the questionnaire was then self-administered. Questionnaires may be delivered as a hardcopy or electronic questionnaire on-line. The researcher provided enough time to ensure that participants understood and understood the questions on their own. Questionnaires which were completed were reviewed for completeness and answers were input into a secure electronic database for statistical analysis.

Data Management and Statistical Analysis: Data collected/obtained were coded, organised and analysed with the help of SPSS (Statistical Package for the Social Sciences) version 26.0. The data set was screened for missing values, duplicates, inconsistencies and possible data entry errors before statistical analysis was performed. Match labels and coding were used in appropriate manner for proper analysis of data.

RESULTS

The 300 student undergraduates in this study are summarized by their sociodemographic characteristics in Table 1. The results showed that most of the respondents were in the younger age groups reflecting the characteristics of students in an academic institution that usually comprise the age group of undergraduate students. The gender profile was composed of different academic years and departments from which participants were selected to be represented at various stages of undergraduate education.

As for marriage status, the majority were unmarried, a typical characteristic of the undergraduate student body at a university. Additionally, the table includes a description of how participants' family history of breast cancer can be related to potential exposure to breast cancer information and awareness.

The sociodemographic data indicate generally that the sample consisted of students from different educational and personal experiences. These characteristics are important, as they are seen to affect students' knowledge, perception and awareness about breast cancer and can have an impact on the learning process. Hence such indicators offer an important benchmark to consider for exploring discrepancies in awareness and knowledge about breast cancer among the undergraduate students.

Table 2 below depicts some general knowledge participants had pertaining to breast cancer and the primary sources from which they read breast cancer information. The discovery sheds light on the growing importance of digital communication in the context of health awareness amongst young adults. But, having awareness does not necessarily mean you have complete knowledge of risk factors, warning signs, prevention and early detection of the disease. Students might have heard or read information in the media about breast cancer, but not had any medically accurate or thorough information or guidance.

Participants' knowledge about risk factors, warning signs and symptoms of breast cancer are showed below in Table 3. Results show that the knowledge of the students regarding various aspects of the disease is different. A variety of risk factors/warning signs were mentioned by some participants and others who did not recall some of the factors that increase the risk of breast cancer.

The results indicate that participants had higher levels of general knowledge about breast cancer that they had specific knowledge about the risk factors or clinical manifestations of the disease. This is significant since people could not have enough general information to detect changes they need to be concerned with or know the risk factors for breast cancer.

A breast lump that first appeared, change in breast shape or size, change in nipple, and an unusual discharge from the nipple should be of particular concern. It should

be noted however, that these changes do not always mean cancer, and do need to be clinically assessed. Similarly, it would be important to identify what factors are known risk factors for breast cancer; these include increasing age, certain inherited change in some genes, family history and alcohol consumption.

Table 4 is a description of the attitude of participants to awareness of breast cancer, early detection, the practice of breast cancer screening and finally, the barrier that could present a hindrance to seeking relevant information and/or healthcare services.

The results showed that students overall showed awareness about importance of breast cancer awareness and early detection. But overall positive attitudes to breast cancer awareness was not always accompanied by regular preventive behaviours or uptake of health services.

Overall, the results suggest that simply increasing public awareness might not be enough. It is also important that universities tackle psychological, social, cultural and informational barriers to facilitate thoughtful decisions about health and a positive approach to seeking health care.

Table 1: Sociodemographic Characteristics of Undergraduate Students (N = 300)

Demographic characteristics	Frequency (n)	Percentage (%)
Age (years)		
18–20	105	35.0
21–23	135	45.0
24–26	48	16.0
Above 26	12	4.0
Academic year		
First year	78	26.0
Second year	72	24.0
Third year	81	27.0
Fourth year	69	23.0
Academic discipline		
Home Economics	66	22.0
Human Development and Family Studies	54	18.0
Food and Nutrition	63	21.0
Textile and Fashion Design	60	20.0
Arts and Social Sciences	57	19.0
Marital status		
Unmarried	279	93.0
Married	21	7.0
Family history of breast cancer		
Yes	42	14.0
No	258	86.0
Total	300	100.0

Table 2: General Awareness and Sources of Information Regarding Breast Cancer

Awareness indicators	Yes n (%)	No n (%)	Don't know n (%)
Have you heard about breast cancer?	276 (92.0)	24 (8.0)	—
Do you know that breast cancer can affect young women?	198 (66.0)	54 (18.0)	48 (16.0)
Are you aware that early detection improves treatment outcomes?	246 (82.0)	24 (8.0)	30 (10.0)
Have you heard about breast self-examination (BSE)?	225 (75.0)	75 (25.0)	—
Are you aware of clinical breast examination?	171 (57.0)	129 (43.0)	—
Have you heard about mammography?	183 (61.0)	117 (39.0)	—
Do you know that breast cancer can occur without a family history?	153 (51.0)	87 (29.0)	60 (20.0)

Table 3: Knowledge Regarding Breast Cancer Risk Factors, Signs, and Symptoms

Knowledge indicators	Correct response n (%)	Incorrect response n (%)	Don't know n (%)
Breast lump or thickening	252 (84.0)	27 (9.0)	21 (7.0)
Changes in breast size or shape	213 (71.0)	48 (16.0)	39 (13.0)
Nipple discharge or inversion	174 (58.0)	66 (22.0)	60 (20.0)
Skin dimpling or redness	165 (55.0)	75 (25.0)	60 (20.0)
Persistent breast or armpit pain	180 (60.0)	66 (22.0)	54 (18.0)
Family history of breast cancer	231 (77.0)	36 (12.0)	33 (11.0)
Increasing age	156 (52.0)	81 (27.0)	63 (21.0)
Obesity and physical inactivity	141 (47.0)	93 (31.0)	66 (22.0)
Alcohol consumption	102 (34.0)	108 (36.0)	90 (30.0)
Previous chest radiation exposure	96 (32.0)	111 (37.0)	93 (31.0)
Hormonal and reproductive factors	120 (40.0)	96 (32.0)	84 (28.0)

Table 4: Attitudes and Practices Regarding Breast Cancer Screening and Early Detection

Attitude and practice indicators	Frequency (n)	Percentage (%)
Attitudes towards breast cancer		
Believe breast cancer is a serious health concern	273	91.0
Believe early detection improves survival outcomes	261	87.0
Believe regular health education is necessary	285	95.0
Feel comfortable discussing breast health with healthcare professionals	174	58.0
Believe women should seek medical advice for unusual breast changes	270	90.0
Breast cancer screening practices		
Have ever performed breast self-examination	105	35.0
Perform breast self-examination regularly	54	18.0
Have ever received a clinical breast examination	39	13.0
Have attended a breast cancer awareness session	108	36.0
Have discussed breast cancer with a healthcare professional	66	22.0
Perceived barriers to screening		
Lack of knowledge about examination techniques	174	58.0
Embarrassment or shyness	156	52.0
Fear of discovering cancer	141	47.0
Lack of access to female healthcare professionals	105	35.0
Financial constraints	90	30.0
Lack of time or motivation	84	28.0

Table 5: Association Between Academic Year and Breast Cancer Knowledge Level

Academic year	Poor knowledge n (%)	Moderate knowledge n (%)	Good knowledge n (%)	Total
First year	45 (57.7)	27 (34.6)	6 (7.7)	78
Second year	35 (48.6)	30 (41.7)	7 (9.7)	72
Third year	32 (39.5)	36 (44.4)	13 (16.0)	81
Fourth year	23 (33.3)	27 (39.1)	19 (27.5)	69
Total	135 (45.0)	120 (40.0)	45 (15.0)	300

The relationship between academic year and breast cancer knowledge among the participants is analysed in Table 5. The results indicated certain differences in the categories of knowledge between academic year, which might mean that acquisition of knowledge throughout the academic years could be linked to some of the knowledge differences found.

DISCUSSION

The objective of present study was to assess the awareness, knowledge and attitudes towards breast cancer and its practices among undergraduate female students of University of Home Economics, Lahore, Pakistan. Besides, it explored the sources of breast cancer information, the issues which hindered the access to breast cancer related health information and association of academic year and level of knowledge.

Results show the general awareness of breast cancer, known by many. This does not, however, mean having a certain amount of knowledge of the disease constitutes good health literacy. Similarly, breast cancer nowadays has been attributed to a lack of awareness among female students of universities, coupled with an incomplete knowledge of the disease in Pakistan[1]. Similarly in other LMICs, gaps have been identified between general awareness and knowledge for early recognition and seeking health care[2,3].

Digital communication can be very convenient, accessible and can convey health information very quickly. But the information gained via social media or online sources can be extremely unreliable and lack scientific merit. Bad information can lead to incorrect assumptions, anxiety or wrong health choices. As part of effective public health interventions, WHO has highlighted the need for health literacy to be enhanced and for information to be readily available and trustworthy[4].

Only 29.8% of the participants in their study were aware of a family history of breast cancer among first-degree relatives as a risk factor. In the same manner, a systematic review and meta-analysis of 18 Pakistani studies with a total of 9,766 women indicated that the overall awareness of breast cancer risk factors and breast cancer symptoms was 42.7% and 41.8% respectively[2]. The results here suggest that knowledge gaps are not an issue in Pakistan, even among the educated.

Warning signs are especially significant for women because they might not seek medical advice if they are unsure of breast changes. Changes that should be medically assessed include a new breast lump, a change in breast shape, an inverted nipple, nipple discharge and dimpling of the skin[3]. Similar results are reflected in Uganda where evidence of relatively high general awareness and intermediate awareness of breast cancer risk factors and symptoms were reported among female university

students by Godfrey et al[5]. Thus, a study conducted in Malaysia among the university students revealed that even though they were aware on breast self examination and clinical examination there was still lack of knowledge on breast cancer risk factors[6-8].

Based on these comparisons, there is a need to include educational interventions in describing the gap between general awareness and specific clinical knowledge. It is important to provide clear evidence of risk factors to students, and refrain from the perpetration of false belief statements or linking ideas that may not be evidence based. Increased age, inherited genetic mutations, prenatal history and activated hormones, diseases, should be explained in an understandable way in particular[3,7, 9-12].

This difference between knowledge and practice has also been observed in previous studies. In their meta-analysis of Pakistan, Abdul Rehman et al. found that only 28.7% of women were practising breast self-examination and 15.3% had ever had a CBE performed[2]. Likewise, Almeshari et al. found to be low levels of awareness in conducting BSE and screening-related knowledge among Hail university students and staffs[8].

In the current study, concerns around embarrassment, fear, lack of knowledge, cultural sensitivity, and an overall uncertainty towards health care services emerged as perceived barriers that may help to explain the lack of consistency between positive attitudes and health-related practices. A recent study conducted in Pakistan has also revealed that embarrassment and confidence on expressing symptoms to HP was a major obstacle with 413 female students enrolled at universities[9-11-14]. Given this, it may be inferred that in addition to information gaps awareness programmes should incorporate psychological and social limitations as well.

Secondly, there is a distinction to be drawn between breast self-awareness and formal breast screenings to be made. Awareness of the appearance of normal breasts and the importance of getting them checked by trained people for any abnormal changes should be given to young university students. The general recommendation should be to integrate evaluation of the age, individual risk level and pertinent clinical guidelines into mammography recommendations and not clear-cutly recommend for all young women[3,13-16].

Other study based in universities also supports the importance of educational exposure. Islam et al. studied breast cancer awareness among health and non-health college students and indicated the importance of a background educational level in the interpretation of the differences in knowledge and attitudes[11, 14-17]. Moreover, Miskeen and Al-Shahrani found something similar in their studies: There was a significant relationship between breast cancer education programmes and breast cancer awareness among medical students in Saudi Arabia[12]. In addition, a study on the effects of structured education on Knowledge, Attitude and Breast Self-Examination (BSE) practices among female tertiary students in the southern region of Nigeria showed some improvement in the performance of BSE after education was given[13].

The results can be considered to be relevant to health education in universities. Students have the chance to access structured awareness programmes through lecturers, seminars, student societies, online platforms and health activities within the campus, making universities an appropriate environment that would provide access to these. Past studies have shown that education can positively impact the BC knowledge and practices[13,18-20]. For this reason, universities need to consider breast health education as an integral part of student welfare and health promotion activities that are based on the evidence.

CONCLUSION

It is important to consider awareness and knowledge about breast cancer in the current study of Female Undergraduates from University of Home Economics Lahore Pakistan. The results showed that, though there is a general awareness of breast cancer (BC), there are still areas lacking by students regarding risk factors, warning signs, early detection, and proper health-seeking actions for breast cancer. This would indicate that breast cancer knowledge isn't necessarily a sign of full understanding and appropriate health choices. The research also reveals the function of the sources and how to build the awareness of the students from these sources. Information about breast cancer can easily be found on social media or online; however, this information is not necessarily accurate or reliable online. Thus, it is imperative that students be able to access accurate and reliable health information based on evidence alone to both enhance their understanding and clear misconceptions.

Recommendations

- Such programmes may include seminars, workshops, interactive lectures, or awareness campaigns; they may be conducted in combination with a health care provider and/or public health expert.
- Teach about known risk factors of BC, a few early signs and prompt clinical assessment. Misconceptions and the difference between proven and unproven risk factors should, in particular, be discussed.
- It is important for students to be encouraged to research breast cancer from reliable sources like World Health Organization, reputable cancer organisations, Government Health Units, academic journals and qualified health care providers.

- With university students relying on digital information platforms, social media are a way to provide easy and timely breast cancer information. Universities can develop educational messages, short videos, infographics and awareness messages, which will have to be analysed by health professionals.
- Tackling health literacy should be integrated into welfare activities, the orientation events and relevant academic courses. Pupils should be learning to: access reliable health information and evaluate, understand and use this.

DECLARATION

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