“Uptake of breast cancer screening services among undergraduate female students in the oldest University of Tanzania: a cross-sectional study”

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Abstract

Background

Worldwide breast cancer is the leading cause of cancer-related death among women. Breast cancer mortality can be reduced by early detection and prevention. Despite the existence of breast cancer screening methods, uptake of breast cancer screening is still very low partly due to a lack of awareness of the risk factors for breast cancer and poor knowledge of the screening services. This study was set to assess uptake of breast cancer screening service among undergraduate female students in Dar es Salaam.

Methods

This was an analytical cross-sectional study which conducted among 434 undergraduate female students using self-administered questionnaires in July 2022. Data were analyzed using Stata Version 15 and presented using descriptive and inferential statistics.

Results

The results of this study show that those who have ever been screened for breast cancer were 37 (9.23%), and 40% of the participants have heard about breast cancer screening methods. The most common screening method practiced by study participants was breast self-examination (48.65%). The knowledge of the participants regarding risk factors for breast cancer was generally low; only 40% of the participants had good knowledge of the breast cancer risk factors.

Conclusion

The uptake of breast cancer screening service in the studied area was generally low, as majority of the participants were not aware of screening methods for early detection of breast cancer.

INTRODUCTION

Breast cancer is the most common type of cancer among women worldwide. In 2018, it was estimated that there were over 2 million new breast cancer cases, with a mortality rate of 626.7 per 100,000 (1). According to the World Health Organization (WHO), more than half of the cases of breast cancer and 36.8% of deaths occur in low and middle-income countries (LMICs) (2).

Breast cancer rate has increased by 5% per year in sub-Saharan Africa and other developing countries (3, 4). Furthermore, the number of breast cancer cases is expected to rise by 13.5% by 2040 (1). According to
the (WHO), rising life expectancy, and adoption of western lifestyles will increase the prevalence rates of breast cancer in developing countries (3, 5).

The mortality rate due to breast cancer in Africa is estimated to continue to be extremely high until therapeutic care and screening techniques are improved. With the exception of African women becoming predisposed to a more inflammatory component of breast cancer, an absence of public awareness of the disease, the absence of structured detection methods, late presentation and lack of effective and accessible treatment options can all contribute to the inconsistent and higher death rate (6–8). Most women detect breast cancer after it has progressed to an advanced stage due to late detection. Earlier studies show that 90% of African women are diagnosed with breast cancer at stage III or IV (9, 10).

The most common methods for detecting breast cancer in its early stages are breast self-examination (BSE), clinical breast examination (CBE) and mammography. Mammography screening is expensive, requires a significant amount of financial and human resources, and is thus not feasible in developing nations (11, 12). BSE is a means for a woman to examine her breast for changes such as discharge, lumps, or thickenings, as well as the early diagnosis of breast lumps. It appeals to women as a predictable screening technique as it is free, safe, requires no equipment, and can be done in privacy (13, 14).

In a low-resource countries like Tanzania, educating women about the danger of breast cancer is a first step toward early detection, as women will be able to assess their risks and take appropriate precautions. Health-care providers, educational institutions, and the media are all essential sources of breast cancer information for women (15). This study aim to assess the uptake of breast cancer screening services among undergraduate female students in Dar es Salaam.

**MATERIALS AND METHODS**

**Aim of the study**

To assess the uptake of breast cancer screening services among undergraduate female students in Dar es Salaam.

**Study setting**

We conducted a cross-section study among 434 undergraduate female students at the University of Dar es Salaam (UDSM), Tanzania in July 2022. UDSM is Tanzania oldest and among prestigious public universities in Tanzania. It was launched in 1961 as a University of London affiliate college. It is a comprehensive university with 7 campus colleges, four schools, and five institutes offering a wide range of academic programs. It has 370 programs in total, including 5 certificate programs, 6 diploma programs, 92 taught undergraduates, and 10 postgraduates, 142 Masters, 17 PhDs and 99 PhDs by short course. The number of students admitted has been steadily increase, reaching 39,958 in the academic year 2020/2021. Female students account for 46% of all students.
Study design

The study employed analytical cross-sectional design using quantitative approach in collection and analysis of data basing on the nature of this study.

Study participants

The study participants were all undergraduate female students at the University of Dar es Salaam who attended their daily classes. Due to the large size of the study population, sampling techniques were employed to get the required number of participants needed for this study.

Sample size

Cochran’s single proportion formula was employed in calculating the sample size, \( n = \frac{Z^2 pq}{d^2} \), where \( n \) = sample size, \( z \) = z-score at 95% confidence level, \( p \) = estimated proportion of an attribute that is present in the population, \( q \) = 1 - \( p \), \( d \) = margin of error. This study assumed a margin of error (\( d \)) of 0.05 at 95% confidence level and an estimated proportion of 27.7% women screened for breast cancer (16). Adjusting for a non-response rate of 5%, 434 students were sampled and invited to participate in the study.

Sampling procedure

We used two levels of stratified sampling method to select the study participants in order to ensure representativeness. First, students were stratified according to school, defined as one of the 5 constituent schools in the University. For each college, students were stratified according to their year of study, where simple random sampling was used to select the required number of students separately from each academic year. This was done by obtaining names of all female students according to their school and year of study from the University’s administration. The names of eligible students were arranged and numbered alphabetically separately for each school and level in a Microsoft excel sheet, where random numbers were generated, and the corresponding students selected to take part of the study. Selected students were approached by the principle investigator and after explaining the study’s objectives and procedures to them, all agreed to participate in the study.

Variables

Dependent variable of this study was, uptake of breast cancer screening services. Participants were asked if they had ever had a breast cancer screening (Yes = 1, No = 0).

Independent variable

- Demographic information (age, marital status, religion, study year, income),
- Knowledge of risk factors for breast cancer, and was measured by asking participants to respond based on Yes or No.
- Awareness of the breast cancer methods, participants were asked question regarding breast cancer screening methods and the responds was (Yes = 1, No = 0).
Data collection

A questionnaire was used to collect data, which included structured and open-ended questions. The questionnaire was written in English before being translated into Kiswahili. Prior to data collection, the instruments were pre-tested. The questionnaire had a total of 22 questions which covered 3 sections including socio-demographic information (8 questions), knowledge regarding breast cancer (2 questions) and awareness of breast cancer screening practices (12 questions).

Data analysis

Data was entered into a Microsoft Excel spreadsheet, where cleaning and coding were done before exporting to STATA for analysis. Cleaned data was exported from excel sheet into Stata software version 15 for analysis. Descriptive analysis was performed in order to describe demographic characteristics and results were presented in tables and charts.

RESULTS

Socio-demographic information of the participants

The socio-demographic information of the participants shows that of the 434 undergraduate females, 3.23% were married and 96.54% were single. The age range of the participants was between 18 and 29 years old, with the majority (68.20%) being between the ages of 22 and 25. Most of the participants were Christians. Furthermore, 22.12% of the participants were first-year students, 28.8% were second-year students, 36.18% were third-year students, and 12.9% were fourth-year students. (Table 1).
Table 1  
Socio-demographic information of the participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–21 years</td>
<td>129</td>
<td>29.72</td>
</tr>
<tr>
<td>22–25 years</td>
<td>296</td>
<td>68.20</td>
</tr>
<tr>
<td>26–28 years</td>
<td>6</td>
<td>1.38</td>
</tr>
<tr>
<td>≥ 29 years</td>
<td>3</td>
<td>0.69</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td>325</td>
<td>74.88</td>
</tr>
<tr>
<td>Muslim</td>
<td>108</td>
<td>24.88</td>
</tr>
<tr>
<td>No religion</td>
<td>1</td>
<td>0.23</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>14</td>
<td>3.23</td>
</tr>
<tr>
<td>Single</td>
<td>419</td>
<td>96.54</td>
</tr>
<tr>
<td>Separated</td>
<td>1</td>
<td>0.23</td>
</tr>
<tr>
<td><strong>Year of study</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First year</td>
<td>96</td>
<td>22.12</td>
</tr>
<tr>
<td>Second year</td>
<td>125</td>
<td>28.8</td>
</tr>
<tr>
<td>Third year</td>
<td>157</td>
<td>36.18</td>
</tr>
<tr>
<td>Fourth year</td>
<td>56</td>
<td>12.9</td>
</tr>
<tr>
<td><strong>Source of income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loan Board</td>
<td>199</td>
<td>45.85</td>
</tr>
<tr>
<td>Parent</td>
<td>235</td>
<td>54.15</td>
</tr>
</tbody>
</table>

**Knowledge on risk factors for breast cancer**

Knowledge of the participants in this study regarding risk factors for breast cancer was generally low. This is due to the fact that, out of 434 participants, 171 (39.4%) have good knowledge on the risk factors for breast cancer, and the common risk factors identified were radiation exposure (67.08%), followed by previous history of breast cancer (60.85%). (Fig. 1)

**Awareness of breast cancer screening methods.**
The participant's awareness of early detection methods for breast cancer was assessed. A total of 162 (40%) participants had heard of the breast cancer screening methods, of the 162 participants, only 9.23 percent have ever been screened for breast cancer, and the most common method mentioned to be used was breast self-examination (48.65%), followed by clinical breast self-examination (32.43%). (Table 2)

<table>
<thead>
<tr>
<th>Breast cancer screening methods</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast self-examination</td>
<td>18</td>
<td>48.65</td>
</tr>
<tr>
<td>Clinical breast examination</td>
<td>12</td>
<td>32.43</td>
</tr>
<tr>
<td>Mammogram</td>
<td>2</td>
<td>5.42</td>
</tr>
</tbody>
</table>

Participants who have ever been screened for breast cancer were able to share some of the reasons that made them decide to screen for breast cancer, and the majority (54.05%) mentioned that they screened for early detection and treatment, followed by the recommendation from the healthcare provider (24.32%), as shown on the graph below. (Fig. 2)

Moreover, participants who had never been screened for breast cancer mentioned some of the reasons that made them not to screen. The most common reason was that they did not have symptoms for breast cancer (37.66%), followed by having no information on breast cancer screening methods (22.44%), as shown in the graph below. (Fig. 3)

**DISCUSSION**

Generally, our findings revealed low uptake of breast cancer screening, with only (9.23%) of the study participants having ever been screened for breast cancer by at least one method. The study found that (48.65%) of the study participants had ever performed breast self-examination, which was the most common method performed in this study. This findings is comparable with the studies done in Gaza, Ghana and Ethiopia (1, 13, 14). In contrast, the finding is also contrary to the studies done among young women in Ethiopia and Malaysia (16, 17). The inconsistency could be attributed to the fact that health science students were the study population in previous studies. On the other hand study conducted in Kenya and Ghana found 50% and 55.1% of the participants respectively had performed breast self-examination which is slightly higher than the current study (13, 18).

Furthermore, this study found that fear of developing breast cancer, early detection and recommendation of treatment from a health provider, and a positive family history of breast cancer were the main explanations given by participants for screening for breast cancer. This finding is similar to the study conducted in Gaza, where participants showed the two important reasons that encourage them to screen for breast cancer, which was the presence of a family history of breast cancer and breast cancer early detection purposes (19). Likewise, the study done in Ethiopia is in agreement with the present study,
where the majority of the participants mentioned that early detection and treatment, health provider recommendation, fear of developing breast cancer, family history, and previous breast problems was the reasons to screened for breast cancer (16).

The findings of this study also revealed barriers or obstacles that hinder other study participants from performing breast cancer screening, including that they do not have signs of the disease, they have no information about breast cancer screening, they do not have a family member with the disease, and they do not know how to perform screening. Studies conducted in Ghana and Turkey found similar results (13, 20). In light of that fact, there is a need for a breast cancer screening program that will help raise public awareness, especially among young women, about the importance of screening and the impacts of late detection and treatment of breast cancer.

The study also found that 40% of the participants reported having ever heard of breast cancer screening methods, and the most commonly identified breast cancer screening method was breast self-examination, followed by clinical breast examination, respectively. These findings were contrary to a study conducted in Ethiopia (14). The difference between this study's findings and those of the previous study may be explained by the study participants' poor knowledge regarding breast cancer screening methods because they were not exposed to related medical schools where they could easily get information about breast cancer screening methods.

In addition, among the participants who reported having heard of breast cancer screening methods, they mentioned the mass media as their main source of information about breast cancer screening methods. The finding is similar with the previous studies done in Ethiopia and Kenya (16, 18). Moreover, the finding is inconsistent with the studies conducted in Gaza and Malaysia, where the main source of information for the participants was derived from their university studies and newspapers, respectively (1, 17).

**Strength and Limitation of the study**

Only a few studies have been conducted in Tanzania on the uptake of breast cancer screening practices. This is an innovative study conducted in Dar es Salaam region to assess the uptake of breast cancer screening practices among undergraduate female students. The scope of our study was limited to one University in which most of the best students are admitted. Therefore, caution should be taken before generalizing the results since university students are not representative of young adults in general, and their perception, risk factors, and breast cancer screening practices may differ from those of the general population.

**CONCLUSION**

The study findings provided baseline information regarding women's knowledge related to breast cancer, its risk factors, and screening methods. Overall, the awareness of breast cancer screening methods was found to be poor which leads to low uptake of breast cancer screening services among study participants. There is a greater need to enhance awareness of women regarding breast cancer and the
importance of early detection of breast cancer. In this regard, both public and private sectors and the healthcare professionals can play an essential role in creating awareness of women regarding breast cancer, and preventive measures. The current study findings should be used as an advocacy tool for policymakers and planners to introduce breast screening and awareness programs in the country.

Declarations

Ethics approval and consent to participate.

The author’s confirm that the research was performed in accordance with the Declaration of Helsinki. Ethical approval was obtained from Muhimbili University of Health and Allied Sciences Review Board (MUHAS-REC-07-2022-1278). The permission to conduct the study was obtained from the University of Dar es Salaam. Furthermore, Verbal and written informed consents was obtained from the participants. Consent was obtained by signing the consent form after a thorough explanation, including the benefits and risks of participation. Participation was voluntary and participants were informed that they were all at liberty to decline to participate or withdraw from the study with no consequences to them at any time. Confidentially was assured to participants, and personally identifiable information like names as not captured.

Consent for publication: Not Applicable.

Availability of data and material: The dataset used and/or analyzed during the current study available from the corresponding author on reasonable request.

Competing interest: The authors declare that they have no competing interest.

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Authors’ contributions

Mary mally: Conceptualization, drafting, data analysis, interpretation, manuscript writing and final approval of the version to be published.

Novatus Tesha: Conceptualization, drafting, data analysis, interpretation, manuscript writing and final approval of the version to be published.

Amani Anaeli: Conceptualization, drafting, data analysis, interpretation, manuscript writing and final approval of the version to be published.

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Authors’ information: Not applicable

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Figures
Figure 1

Shows knowledge of the participants regarding risk factors for breast cancer

Figure 2

A bar graph showing reasons for screening for breast cancer
Figure 3

A bar graph showing reasons not to screen for breast cancer