Al-Hawash Private University

Detection of Breast Cancer Among Women in the Middle Region of Syria: A Cross-Sectional Study Protocol

Date: July 11th , 2025

Abstract

Breast cancer remains the most prevalent malignancy among women globally and constitutes a significant cause of cancer-related mortality. In Syria, particularly in the middle region, the incidence of breast cancer has been steadily increasing, exacerbated by the ongoing humanitarian crisis that has disrupted healthcare infrastructure and services. This cross-sectional study aims to assess the awareness, knowledge, and practices related to early detection of breast cancer among women in the middle region of Syria. Approximately 1,000 women aged 18 years and older will be recruited through online platforms and community health centers. Data will be collected using a structured questionnaire covering demographic information, awareness of breast cancer symptoms and risk factors, knowledge of breast self-examination techniques, history of professional screenings, and perceived barriers to seeking medical help. Statistical analysis will be performed to identify associations between awareness levels and demographic factors. The findings from this study will provide crucial insights into the current state of breast cancer awareness and screening practices in the region, informing the development of targeted public health interventions aimed at improving early detection rates and, consequently, survival outcomes among Syrian women.

Introduction

Breast cancer represents a significant global health concern, particularly for women, as it is the most diagnosed cancer and a leading cause of cancer-related mortality worldwide. The World Health Organization estimates that approximately 2.3 million women are diagnosed with breast cancer annually, with mortality rates being disproportionately higher in low and middle-income countries due to late-stage diagnosis and limited access to treatment (WHO, 2023).

In Syria, the healthcare system has faced unprecedented challenges due to the protracted conflict, resulting in disrupted services, damaged infrastructure, and limited resources. These circumstances have significantly impacted cancer care, including breast cancer screening, diagnosis, and treatment. The middle region of Syria, which encompasses several governorates including Homs and Hama, has been particularly affected by these

disruptions, potentially leading to delayed diagnoses and poorer outcomes for breast cancer patients.

Early detection of breast cancer is crucial for improving survival rates and reducing the burden of advanced disease. When detected at an early stage, breast cancer has a five-year survival rate of over 90%, compared to less than 30% when diagnosed at advanced stages (American Cancer Society, 2023). Early detection strategies include breast self-examination (BSE), clinical breast examination (CBE), and mammography, all of which require adequate awareness and knowledge among women.

Recent studies indicate that many women in Syria lack adequate knowledge about breast cancer risk factors, warning signs, and the importance of early detection. For instance, a study conducted in 2023 revealed that a sizable portion of Syrian women demonstrated insufficient awareness regarding breast cancer symptoms and preventive measures. This lack of awareness is compounded by the ongoing humanitarian crisis, which has disrupted healthcare services and education.

The present study aims to address this critical gap by assessing the awareness and practices related to early detection of breast cancer among women in the middle region of Syria. By identifying barriers to effective screening and intervention, this research will contribute to the development of targeted public health strategies that can enhance early detection efforts, ultimately improving health outcomes for women in this region.

Methods

Study Design and Setting

This research will employ a cross-sectional study design to evaluate breast cancer awareness and early detection practices among women in the middle region of Syria. The cross-sectional approach allows for the assessment of prevalence and associated factors at a specific point in time, providing a snapshot of the current situation. The study will be conducted in both urban and rural areas within the middle region of Syria, encompassing the governorates of Homs, Hama, and surrounding areas. Data collection will occur over a six-month period, tentatively scheduled from September 2025 to February 2026.

Study Population and Sampling

Inclusion and Exclusion Criteria

The study population will consist of women aged 18 years and older residing in the middle region of Syria. Women with a previous diagnosis of breast cancer will be excluded from the study, as their knowledge and practices may be influenced by their experience with the disease, potentially introducing bias into the results.

Sample Size Determination

A sample size of approximately 1,000 participants will be targeted to ensure statistical significance and representativeness. This sample size was calculated using the formula for cross-sectional studies with a 95% confidence interval, 3% margin of error, and an estimated prevalence of breast cancer awareness of 50% (to maximize sample size). The sample size was further adjusted to account for a potential non-response rate of 15%.

Sampling Technique

A multi-stage sampling technique will be employed to select participants. First, districts within each governorate will be randomly selected. Within each selected district, communities will be randomly chosen. Finally, eligible women from these communities will be invited to participate through various recruitment channels, including community health centers, women's organizations, and online platforms.

Data Collection Instruments and Procedures

Data will be collected through a structured questionnaire that has been developed based on a comprehensive literature review and adapted to the Syrian context. The questionnaire will be translated into Arabic and back translated to ensure accuracy and cultural appropriateness. It will be pre-tested on a sample of 50 women who will not be included in the final study.

The questionnaire will consist of the following sections:

1. Demographic Information: This section will gather data on age, education level, marital status, occupation, income level, place of residence (urban/rural), and access to healthcare services.

2. Awareness of Breast Cancer: This section will assess knowledge about breast cancer symptoms, risk factors, and warning signs. Participants will be asked to identify common

symptoms and risk factors from a list, and their responses will be scored to determine their level of awareness.

3. Breast Self-Examination (BSE) Knowledge and Practice: Questions in this section will evaluate participants' knowledge of BSE techniques, frequency of practice, and confidence in performing the examination correctly.

4. Professional Screening History: This section will gather information on participants' history of clinical breast examinations and mammography, including frequency, most recent screening, and factors influencing their decision to undergo professional screening.

5. Barriers to Early Detection: This section will identify perceived barriers to seeking medical help for breast-related concerns, including financial constraints, accessibility issues, cultural factors, and knowledge gaps.

The questionnaire will be administered through two main channels:

1. Online Survey: An electronic version of the questionnaire will be distributed through social media platforms, email lists of women's organizations, and other online channels to reach a diverse audience.

2. In-person Data Collection: Trained female research assistants will administer the questionnaire at community health centers, women's gatherings, and other community settings to ensure inclusion of women with limited internet access.

Methods of Breast Cancer Detection

Early detection of breast cancer significantly improves treatment outcomes. Various methods are employed for screening and diagnosis, each with specific applications and benefits. The study aims to assess awareness and practices related to these methods among the target population.

Mammography: A mammogram is an X-ray picture of the breast, widely used for both screening women without symptoms and for diagnostic purposes when symptoms or abnormalities are present. This low-dose X-ray technique can detect tumors that cannot be felt during a physical examination, as well as microcalcifications, which can sometimes indicate the presence of breast cancer. During the procedure, the breast is compressed between two plates to obtain clear images. While highly effective, the sensitivity of mammography can be reduced in women with dense breast tissue. Advanced techniques like 3D mammography (tomosynthesis) can provide more detailed images, particularly beneficial for dense breasts.

Breast Ultrasound (Echo): Breast ultrasound uses high-frequency sound waves to create detailed images of the internal structures of the breast. It is a non-invasive procedure that does not involve radiation. Ultrasound is particularly valuable as a complementary tool to mammography, especially for women with dense breast tissue, where mammography's effectiveness may be limited. It is highly effective in distinguishing between solid masses and fluid-filled cysts, providing crucial information about the nature of suspicious areas. While ultrasound can detect small, invasive cancers that might be missed by mammography, it cannot definitively diagnose cancer; a biopsy is typically required for confirmation. Ultrasound can also be used to guide biopsy procedures.

Blood Testing: Complete blood counts were conducted for each participant.

Ethical Considerations

The study protocol will be submitted for approval to the relevant ethical review committees. Informed consent will be obtained from all participants before data collection. Participants will be assured of confidentiality and anonymity, and they will have the right to withdraw from the study at any time without consequences. All data will be stored securely with password protection, and only the research team will have access to the raw data.

Data Analysis Plan

Data will be analyzed using Statistical Package for Social Sciences (SPSS) version 27.0. The analysis will proceed as follows:

1. Data Cleaning and Preparation: The dataset will be checked for completeness, consistency, and accuracy. Missing data will be handled according to appropriate statistical methods.

2. Descriptive Statistics: Demographic characteristics of the participants will be summarized using frequencies, percentages, means, and standard deviations as appropriate. Levels of awareness, knowledge, and practices related to breast cancer early detection will be presented using similar descriptive statistics.

3. Inferential Statistics: Chi-square tests will be used to assess associations between categorical variables, such as the relationship between education level and awareness of breast cancer symptoms. For continuous variables, t-tests or ANOVA will be employed as appropriate. Multivariate logistic regression analysis will be conducted to identify factors independently associated with breast cancer awareness and screening practices, controlling potential confounders.

4. Thematic Analysis: Responses to open-ended questions about barriers to seeking medical help will be analyzed using thematic analysis to identify common themes and patterns.

A p-value of less than 0.05 will be considered statistically significant for all analyses.

Anticipated Results

While the actual results will be determined following data collection and analysis, several anticipated outcomes can be projected based on existing literature and the Syrian context:

Demographic Distribution

It is anticipated that the study sample will reflect the demographic diversity of the middle region of Syria, with variations in age, education level, and socioeconomic status. Given the current situation in Syria, a considerable proportion of participants may be internally displaced persons, which could influence their access to healthcare services and information.

Awareness and Knowledge Levels

Based on previous studies in similar contexts, it is expected that overall awareness of breast cancer symptoms and risk factors may be moderate to low, with significant variations based on education level, urban/rural residence, and age. Younger, more educated women from urban areas are likely to demonstrate higher levels of awareness compared to older, less educated women from rural areas.

Specific knowledge gaps may be identified regarding:

*   Non-lump symptoms of breast cancer (e.g., skin changes, nipple discharge)

*   Modifiable risk factors (e.g., physical inactivity, alcohol consumption)

*   Appropriate age to begin regular screening

*   Recommended frequency of breast self-examination and professional screening

Breast Self-Examination Practices

It is anticipated that while many women may have heard of breast self-examination, a smaller percentage will report practicing it regularly and correctly. Barriers to regular BSE may include lack of confidence in performing the examination correctly, fear of finding a lump, and misconceptions about the necessity of the practice.

Professional Screening Utilization

Given the disrupted healthcare system in Syria, utilization of professional screening services (clinical breast examination and mammography) is expected to be low. Factors associated with higher utilization may include higher education, higher income, urban residence, and having a family history of breast cancer.

Barriers to Early Detection

Multiple barriers to early detection are likely to be identified, including:

1. Structural Barriers: Limited availability of screening services, geographical distance to healthcare facilities, cost of services, and lack of female healthcare providers.

2. Knowledge-Related Barriers: Insufficient awareness of breast cancer symptoms and the importance of early detection, misconceptions about the disease, and lack of knowledge about screening recommendations.

3. Psychosocial Barriers: Fear of diagnosis, embarrassment, fatalistic beliefs about cancer, and competing priorities due to the challenging living conditions in Syria.

4. Cultural Barriers: Traditional beliefs, gender norms that discourage women from seeking healthcare for breast-related concerns, and stigma associated with cancer.

Associations Between Variables

Significant associations may be found between:

* Education level and breast cancer awareness

* Socioeconomic status and utilization of professional screening services

* Urban/rural residence and knowledge of breast self-examination techniques

* Age and perceived barriers to seeking medical help

* Family history of breast cancer and screening practices

These anticipated results will provide a foundation for the development of targeted interventions to address specific gaps in awareness and barriers to early detection.

Discussion

The findings of this study will provide valuable insights into the current state of breast cancer awareness and early detection practices among women in the middle region of Syria. These insights are particularly important given the context of the ongoing humanitarian crisis, which has significantly impacted healthcare delivery and access to information.

Implications for Public Health Practice

The results of this study will have several important implications for public health practice in Syria:

1. Targeted Educational Interventions: By identifying specific knowledge gaps and misconceptions about breast cancer, this study will inform the development of educational materials and campaigns that address these gaps. These interventions can be tailored to different demographic groups based on their specific needs and barriers.

2. Healthcare Service Improvements: Understanding the barriers to professional screening will help healthcare providers and policymakers develop strategies to improve access to and utilization of screening services. This may include mobile screening units to reach rural areas, training more female healthcare providers, or implementing subsidized screening programs for vulnerable populations.

3. Community-Based Approaches: The findings may support the development of community-based approaches to breast cancer awareness and early detection, such as peer education programs or community health worker initiatives, which can be particularly effective in contexts where formal healthcare systems are strained.

4. Policy Recommendations: The study results can inform policy recommendations for the Syrian health authorities and international organizations working in the region, highlighting the need for prioritizing breast cancer early detection within the broader healthcare agenda.

Comparison with Existing Literature

The anticipated findings of this study will be discussed in relation to existing literature on breast cancer awareness and early detection in similar contexts, particularly in conflict-affected settings and other Middle Eastern countries. This comparison will help identify whether the patterns observed in Syria are unique to its specific context or reflect broader regional or global trends.

For instance, studies from neighboring countries like Jordan and Lebanon have reported varying levels of breast cancer awareness and screening practices, influenced by factors such as education, socioeconomic status, and cultural beliefs. The extent to which these factors play a similar role in the Syrian context will be explored.

Strengths and Limitations

Strengths

1. Comprehensive Assessment: This study will provide a comprehensive assessment of breast cancer awareness, knowledge, practices, and barriers in a population that has been understudied due to the ongoing conflict.

2. Mixed Recruitment Strategy: The use of both online and in-person data collection methods will help reach a diverse sample of women, including those with limited internet access.

3. Contextual Relevance: The study design and instruments have been adapted to the specific context of Syria, enhancing the relevance and applicability of the findings.

Limitations

1. Cross-Sectional Design: The cross-sectional nature of the study limits the ability to establish causal relationships between variables. Future longitudinal studies may be needed to track changes in awareness and practices over time.

2. Self-Reported Data: The reliance on self-reported data may introduce recall bias or social desirability bias, particularly regarding screening practices.

3. Sampling Challenges: The ongoing conflict and population displacement may pose challenges to achieving a truly representative sample, potentially limiting the generalizability of the findings.

4. Security Concerns: Security issues in certain areas may restrict access to some populations, potentially introducing selection bias.

These limitations will be acknowledged and addressed to the extent possible in the study design and implementation.

Future Research Directions

Based on the anticipated findings, several directions for future research can be identified:

1. Intervention Studies: Developing and evaluating the effectiveness of interventions aimed at improving breast cancer awareness and screening practices based on the identified barriers and facilitators.

2. Healthcare Provider Perspectives: Investigating the knowledge, attitudes, and practices of healthcare providers regarding early detection of breast cancer, as they play a crucial role in promoting screening and early diagnosis.

3. Qualitative Exploration: Conducting in-depth qualitative studies to better understand the cultural, psychological, and social factors influencing women's decisions about breast cancer screening.

4. Health System Analysis: Assessing the capacity of the Syrian health system to provide breast cancer screening and diagnostic services, finding gaps and opportunities for improvement.

5. Longitudinal Studies: Implementing longitudinal studies to track changes in awareness and practices as the situation in Syria evolves and as interventions are implemented.

Conclusion

The early detection of breast cancer is vital for reducing mortality rates and improving the quality of life for women affected by this disease. This study will provide essential data to guide public health initiatives and enhance awareness and screening practices in the middle region of Syria, where healthcare resources are limited and the population faces numerous challenges due to the ongoing conflict.

By finding gaps in knowledge and barriers to screening, the study aims to support the development of targeted interventions that can enhance early detection efforts, ultimately improving health outcomes for women in Syria. Through effective education and intervention, we can work towards reducing the impact of breast cancer on women's health in this region, even in the face of challenging circumstances.

The findings of this study will not only contribute to the understanding of breast cancer awareness in Syria but may also provide insights relevant to other conflict-affected settings where healthcare systems are strained and populations face similar barriers to accessing preventive services.

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