Predictors Affecting Breast Self-Examination Practice among Jordanian Female University Students

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Abstract

Background: Breast cancer is one of the most common types of cancer among women in both the developed and developing world. Most women are diagnosed with breast cancer in late stages of the disease; efforts to fight it should start earlier with screening and early detection.

Aims: To evaluate the level of Jordanian female university students' practice of breast self-examination, and to identify the predictors of their practice of BSE.

Methods: A descriptive, cross-sectional design was utilized. Data were collected from 236 participants froma public university in the southern region of Jordan during February-March 2017, usingself-administered questionnaires that was developed for the purpose of this study.

Results: The findings show a low Breast self-examination practices, as (37.5%) of the participants were found to practice BSE, which had a significant positive correlation with all aspects of knowledge regarding BC; the highest correlation was with knowledge of BSE ($r= .273$, $P<0.01$) and the lowest was with knowledge of BC warning signs ($r= .139$, $P<.05$). Similarly, participants' practice of BSE had a significant positive correlation with their attitude toward it ($r= .381$, $P<0.01$). Further analysis revealed a three-predictor model (knowledge of BC risk factors, knowledge of BSE,

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and attitudes toward BSE) that explained about 21% of the variance in participants' practice of BSE (R^2= .21, F(230)=13,02, P= .000).

Conclusion:

This study points to an emergent need to increase female students' awareness about the importance of Breast self-examination by tailored educational programmes that promote their BSE practice. The results from this study can be used by faculties of health sciences and educators to adopt and develop new curricula, activities and events that emphasize breast health awareness and the benefits of BSE.

Keywords: Breast Cancer; Breast Self-Examination; Predictors; Female University Students; Jordan.

تنبؤات ممارسة الفحص الذاتي للثدي لدى طالبات الجامعة في الأردن

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ملخص

الخلفية: سرطان الثدي هو أحد أكثر أنواع السرطان شيوعًا بين النساء في العالمين: المتقدم والنامي. يتم تشخيص معظم النساء بالسرطان في المراحل المتأخرة من المرض، وعليه يجب أن تبدأ جهود العلاج من الكشف والفحص المبكر.

الأهداف: تقييم مستوى ممارسة الطالبات الجامعيات الأردنيات للفحص الذاتي للثدي، وتحديد التنبؤات لممارستهم للفحص الثدي الذاتي.

الطريقة: تم استخدام تصميم وصفي لجمع البيانات. شَمَلَتْ عينة البحث 236 مشاركه من جامعه حكومية في جنوب الأردن باستخدام استبيانات تعبأ ذاتيا أعدت لتحقيق أهداف الدراسة. حيث تم جمع البيانات خلال شهر شباط وآذار.

النتائج: أظهرت النتائج انخفاض مستوى الممارسة للفحص الذاتي للثدي للمشاركات (37.5 ٪) ، وقد كان ذلك مرتبطا ارتباط إيجابي كبير مع جميع جوانب المعرفة بشأن سرطان الثدي ، مع أعلى علاقة مع المعرفة يالفحص الثدي الذاتي (r = .273 ، P <.01) و أدنى ارتباط مع المعرفة من علامات الخطورة (r=. 139 ، P <.05). وبالمثل، كانت ممارسة المشاركين للفحص الثدي الذاتي علاقة إيجابية كبيرة مع مواقفهم من الفحص الثدي الذاتي (r =. 381، P <.01). وكشف تحليل إضافي عن نموذج predictor−3 (معرفة عوامل خطر BC ، ومعرفة الفحص الثدي الذاتي ، والمواقف تجاه BSE) التي أوضحت حوالي 21 ٪ من التباين في ممارسة المشاركين للفحص الثدي الذاتي (R2 = .21، F (230) = 13 ،02، P = .000).

الاستنتاج: تشير هذه الدراسة إلى الحاجة الماسة إلى زيادة وعي الطالبات حول أهمية الفحص الثدي الذاتي من خلال برامج تعليمية مصممة خصيصًا لتعزيز ممارستهم للفحص الثدي الذاتي والتأكيد على إدراج مادة التوعية الوطنية حول الكشف المبكر عن سرطان الثدي في مناهج الجامعة من شأنه أن يزيد المعرفة بين الفتيات في أعمار صغيرة ولالتزام بالممارسات الصحية الجيدة فيما بعد.

Introduction

Today, breast cancer (BC) is one of the most common types of cancer among women in both the developed and developing world, and is the second leading cause of cancer death after lung cancer (World Health Organization, 2013). The international incidence of BC varies widely, from 19.3 per 100,000 women in East Africa to 89.7 per 100,000 women in Western Europe(World Health Organization, 2017). In Middle Eastern countries, BC incidence rates are increasing. For example, the Jordan Cancer Registry reported that BC is the most prevalent cancer among women, with a total number of 926 cases (36.8%) in 2012.

Internationally American Cancer Society [ACS] has released a new guideline for breast cancer screening in average-risk women in 2015. The guideline stressed that all women should have an annual mammogram at age 45, and then every other year at and age 55. However, the new guideline has no longer recommend the clinical breast examination and breast self-examination (BSE) as a part of the screening. Because mammography, one of the most prominent early detection methods for breast cancer, it is expensive, ACS (2017) recommended that all women should be aware of how their breasts look and feel by regularly carrying out BSE, so that they will be able to identify changes and report them without delay to their healthcare providers, moreover, BSE is an effective tool for increasing breast cancer awareness (ACS, 2017; Oeffinger, et al., 2015).

In Jordan, awareness campaigns have been developed to shed light on the importance of BSE and mammograms, that should begin at the age of 40 years for early detection. BSE is a simply-learnt and practical method that is harmless, convenient and inexpensive to enable women to recognize any change in their breast tissue (Yurdakos, Gulhan, Unalan, & Ozturk, 2013).

Despite the relative effectiveness and the proposed benefits of BSE, its application remains less than assumed For instance, a study conducted among Jordanian female registered nurses found that only 17.7% reported that they practice BSE every month (Alkhasawneh, Akhu-Zaheya, & Suleiman, 2009). A similar result was found among women in Turkey, where only 16% reported that they performed BSE every month (Yurdakos, et al., 2013). A study in Ethiopia among female school teachers found only

16.5% of the respondents had heard about BSE, and that 73.07 % of them had never been examined in this way (N. Birhane, Mamo, Girma, & Asfaw, 2015). The problem is prevalent among younger females where similar findings have been reported among university students. For instance, a study among female undergraduate students in Jordan found that the Participants' total score of knowledge was 12.30/27 (45.5%), which indicates participants had limited knowledge and awareness about BC and BSE (Alsaraireh & Darawad, 2018).

A study of 820female under graduates in Malaysia found most of the respondents(99.5%)were aware of BSE, but only 19.6% practised it(Akhtari-Zavare, A Lattif, Juni, Md Said, & Ismail, 2015). A similar study in Ethiopia revealed that only 28.3% of the participants had performed BSE (Birhane, et al., 2017).

In respect to the determinants and predictors of BSE, the literature reports many controversial issues regarding which variables may affect BSE practice. For instance, (Freitas & Weller, 2016) found that performing BSE was more frequent among married women, and that those with a higher income or had a close relative with BC and had better knowledge of the risk factors. A Turkish study revealed that being in younger age groups (under50), being housewives and having a family history of BC were associated with more frequent BSE practice (Doganer, et al., 2014). In contrast, a Brazilian study found that women below the age of30 or above 60 never performed BSE (Freitas & Weller, 2016).Other studies have emphasized that knowledge about BC and risk factors, as well as BC warning signs, and having a family history with BC, may affect women's performance of BSE(Erdem & Toktaş, 2016; Tilaki & Auladi, 2015; Akhtari-Zavare, Ghanbari-Baghestan, Latiff, Matinnia, & Hoseini, 2014). Therefore, more studies are needed to verify this controversy, in this case among female university students, so more focus can be directed to those who practice less.

In Jordan, the few studies that have investigated BSE have focused on the general population (Al-Hussami, Zeilani, AlKhawaldeh, & Abushaika, 2014)and female nurses (Al-Khasawneh et al., 2016),with none invetigating the younger age group ofuniversity students. Also, few Jordanian studies have included females from the southern region of the country. Hence, the findings from this study will open the door for females of university age to increase their own awareness and that of their relatives and others in the

community about BC and BSE. Moreover, the results can provide information on BSE for government and non-government health organizations working to increase awareness of BC and appropriate methods for its early detection and recognition. Specifically, this study aims to answer the following questions:

1. What is the level of Jordanian female students' practice of BSE?
2. Are there relationships among female students' practice of BSE with their attitudes towards BSE and knowledge of breast cancer?
3. What are the predictors of BSE practices among female students in southern of Jordan?

Methods

Design

As part of a larger project aiming at promoting female university students' awareness of BC and importance of practising BSE, this study used a descriptive cross-sectional design with self-reported questionnaires.

Setting

Participants were recruited from a public university in the southern region of Jordan, which has a total of 15 colleges and more than 17,000 students making this university the largest in its region. This study was carried out among female university students.

Sampling

This study focused on all female university students in Jordan, for which a sample of female university students was conveniently recruited from various colleges. Eligibility criteria included being a female university student, registered at the participating university at the current semester, and accepted participation. However, married students who were pregnant or on breastfeeding, and students registered at heath colleges at third year and higher were excluded.

Instrument

In addition to the socio-demographic data sheet developed by the current researcher. Participants' practice of BSE was examined by a 7-

item scale adopted from a previous work of (Rosmawati, 2010). The scale focused on frequency of performing seven actions related to BSE, a 5-point Likert type scale ranging from 0 (rare) to 4 (always), with a range between 0-28 , a higher scores indicate more practicing of BSE.

Potential predictors that were assessed were participants' knowledge of BC and BSE (four sub-scales) and attitudes toward BSE. To assess their knowledge of BC and BSE, the Breast Cancer Awareness Measure-Arabic (BCAM-A) was used. This scale was developed and validated by the College of Nursing-Sultan Qaboos University (Al-Khasawneh, et al., 2016) and based on the original BCAM developed by King's College London in collaboration with University College London (Linsell et al., 2010).

The BCAM-A contains 27 Yes/No/Don't know items that measure participants' knowledge regarding 11 BC warning signs, nine BC risk factors; three items regarding BC screening programmes, and four items regarding BSE. The score of each sub-scale was calculated after awarding one mark for each correct answer, and zero for incorrect/don't know answers. Participants' attitude to BSE were assessed using a scale asking participants to report their agreement with 13 items concerning BSE (Rosmawati, 2010). A 5-point Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree) was used. The mean score (out of 4) was calculated considering the negatively-stated items, with higher scores indicating more positive attitudes toward BSE.

Both the practice and attitude scales were translated from English into Arabic using the standard forward and backward translation by a panel of expertise, to ensure accuracy of wording and meaning of items, a panel of two maternal experts, two doctoral prepared nurses who are specialized in maternal health and two laypersons who are competent in both Arabic and English languages asked to translate and back-translate the questionnaires, the translated versions were used in a pilot study among 15 students, who were excluded, to assess their clarity and readability. The pilot study revealed positive results, where minimal changes were needed examples? .

Data collection

The researchers contacted the university administration to gain permission to conduct the study. The data were collected by three research assistants who were trained over two days on assistance, how to collect the data, and remind the participant of the importance of completing all the

questions in a honest way. First, the research assistant handed the research folder to the volunteers who were willing to take part in this study. The folder included a cover letter explaining the purpose of the research project, pen, consent form and the questionnaire. Then the research assistant explained verbally the purpose of the study and obtained a signed consent from each participant. The research assistants stayed with participants during the data collection process, to answer any questions and clarify vague items if any. when the participants completed the qauesatioares, they were handed back to the research assistants.

Ethical Considerations

The Ethics Research Committee at the Faculty of Nursing-Mutah University revised and approved the protocol of this study. All participants' rights were protected and ethical principles were considered throughout the study. Participation was completely voluntary, and anonymous questionnaires were used with no personal identifications.

Statistical analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS, version19). Descriptive statistics were used for the purpose of describing participants' demographics and the study main variables. The Pearson correlation test was used to evaluate the relationships among the study variables (knowledge, attitudes and practice). After testing assumptions, multiple linear regression was used to identify the potential predictors of the main study variable (participants' practice of BSE).

Results

As shown in Table 1, a total of 236 students agreed to participate and returned full questionnaires. Two hundred and sixteen (91.5%)were single, and 176 (74.6%)lived in the southern region of Jordan. Regarding their academic profile, 127(53.8%) were students from humanities colleges,231 (97.9%) were registered on bachelors programmes and the participants were distributed over the four university years. Finally, 21 (8.9%) reported having

a positive family history of BC, and 159 (67.4%) reported previous knowledge about BC.

Table (1) Participants' Demographic Characteristics (N=236)

Characteristics	n(%)	Mean (SD)
Age (years)		20.52(2.5)
Marital Status		
Single	216(91.5)	
Married	18(7.5)	
Residence		
North	11(4.7)	
Middle	49(20.8)	
South	176(74.6)	
Program		
Bachelor	231(97.9)	
Master	5(2.1)	
College		
Health	34(14.4)	
Science	75(31.8)	
Humanities	127(53.8)	
Academic Year		
First	56(23.7)	
Second	82(34.7)	
Third	50(21.2)	
Fourth	48(20.3)	
Family History of BC		
Yes	21(8.9)	
No	215(91.1)	
Previous Knowledge about BC	159(67.4)	
Yes	77(23.6)	
No		

Table (2) summarizes participants' responses to the main study variables, including their knowledge of BC warning signs, risk factors, screening programmes, their knowledge of BSE, and their attitudes to and practice of BSE. Generally, participants scored best regarding knowledge of

BSE (58%) and least regarding BC risk factors (27.9%). More than half of participants (56.3%)had positive attitudes toward BSE, but fewer practised BSE, and less frequently than recommended (37.5%).

Table (2) Means & Percentages of Main Study Variables

Variable	%	Mean (SD)
BC Knowledge: Warning Signs	55	6.05 (3.17)
BC Knowledge: Risk Factors	27.9	2.51 (1.97)
BC Knowledge: BSE	50	2.00 (1.17)
BC Knowledge: Screening Programme	58	1.74 (0.72)
Attitudes towards BSE	56.3	2.25 (0.49)
Practice of BSE	37.5	1.50 (0.70)

BC: Breast Cancer, BSE: Breast Self-Examination

To answer the second research question regarding the correlates of BSE practice, the Pearson correlation test was utilized. As shown in Table 3, practice of BSE had a significant positive correlation with all aspects of knowledge, with the highest correlation knowledge withBSE (r= .273, P<.01) and the lowest correlation knowledge with BC warning signs (r= .139, P<.05). Similarly, participants' practice of BSE had a significant positive correlation with their attitude toward BSE (r= .381, P<.01).It was noteworthy that attitude toward BSE had a significant positive correlation with knowledge of BC warning signs (r= .270, P<.01), BSE (r= .225, P<.01), and screening programmes (r= .152, P<.05).

Table (3) Summary of Correlations among Study Variables

Variable	1	2	3	4	5	6
1. BC Knowledge: Warning Signs	1					
2. BC Knowledge: Risk Factors	.446**	1				
3. BC Knowledge: BSE	.317**	.329**	1			
4. BC Knowledge: Screening Programme	.086	.143*	.183**	1		
5. Attitudes towards BSE	.270**	.107	.225**	.152*	1	
6. Practice of BSE	.139*	.248**	.273**	.186**	.381**	
* P< .05, ** P<.01 BC: Breast Cancer, BSE: Breast Self-Examination						

The final research question was concerned with identifying potential predictors of participants' practice of BSE. This question was answered using a multiple linear regression test, for the four aspects of knowledge of BC and BSE and attitudes toward BSE as potential predictors. The results (Table 4) revealed a three-predictor model (knowledge of BC risk factors, knowledge of BSE, and attitudes toward BSE) that explained about 21% of the variance in practice of BSE (R^2= .21, F (230)=13,02, p .000). The strongest predictor was attitudes toward BSE (β= 0.339, t(230)= 5.500, p= .000), and the weakest predictor was knowledge of BSE (β= 0.146, t(230)= 2.278, p= .024).

Table (4) Predictors of Practice of Breast Self-Examination

Variable	B	SE□□	□	t	P
Constant	.036	.206		.176	.861
BC Knowledge: Warning Signs	-.020-	.015	-.092-	-1.349-	.179
BC Knowledge: Risk Factors	.069	.024	.192	2.870	.004
BC Knowledge: BSE	.089	.039	.146	2.278	.024
BC Knowledge: Screening Programme	.085	.058	.088	1.466	.144
Attitudes towards BSE	.037	.007	.339	5.500	.000
Predictors of Practices of Breast Self-Examination produced at α=0.05, F=13.02, P=.000, R^2= .21 BC: Breast Cancer, BSE: Breast Self-Examination					

Discussion

This study aimed to evaluate the level of Jordanian female university students' practice of BSE and to identify the predictors of BSE practices. In fact, all women in developing countries are at a higher risk of developing BC(WHO, 2017). The evaluation and predictors of BSE practice especially among younger females is significant for the successful implementation of national BC educational programmes, and to empower students with information to enable them understand and express their health needs and to ask for assistance without delay in the event of problems.

The results of the current study revealed that only (37.5%) of the participants performed BSE. However, the American Cancer Society has no longer recommend that all women practice monthly Breast self-examination (BSE). Therefore, the new guideline encourages women Breast Self Awareness. This is essential because it permits a woman to be familiar with her normal breast appearance and structure and thus encourage her to observe any abnormality (ACS, 2017).

Our findings are similar to that reported by previous Malaysian study which found that only 7% of women had a good BSE practice score (Rosmawati, 2010). Likwise, other scholars found that19% and 12% of female school teachers in Malaysia and Ethiopia respectively performed monthly BSE (Parsa, Kandiah, & Parsa, 2011; Birhane, et al., 2015) .

The results of this study are also consistent with earlier Jordanian research which reported that women to be less compliant with recommended healthy practice (Darawad, Mosleh, Khalil, Maharmeh, Hamdan-Mansour, & Samarkandi, 2016; Khalil, Darawad, Eljamal, Hamdan-Mansour, Mosleh, Darawad, 2014 & Abed, 2012) , which requires more cultural efforts that encourage compliance. However, the resaluts are inconsistent with previous raesrch from Turkey and Brazil where 78.7% and 79.0% of women respectively were performing a monthly BSE (Doganer, et al., 2014; Freitas & Weller, 2016). The explanations for this inconsistency might be due to the difference in the level of knowledge towards BSE among the different population and the other possible explanation might be the accessibility to information or mass media that emphasize the BSE.

Among female university students, previous studies showed that the practice of BSE worldwide is low. For instance, the percentage of students who practiced BSE was 8.6% in the USA(Early, Armstrong, Burke, & Thompson, 2011), 27% in Korea (Shin, Park, & Kim, 2012), 22.7% in the UAE(Al-Sharbatti, Shaikh, Mathew, & Al-Biate, 2013),19.6% in Malaysia students (Akhtari-Zavare, et al., 2015), and 28% in Ethiopia(Birhane, et al., 2017) .

There are three possible explanations for the low percentage of BSE practice found in our study. First, the students may not have adequate knowledge about the advantages or the skills required for BSE. Second is the low perception of risk of illness of Jordanian females (Alfasfos, Darawad, Nofal, Samarkandi, & Abdulqader, 2016);(Darawad, Alfasfos, Saleh, Saleh, & Hamdan-Mansour, 2016).Third is insufficient implementation of national screening programmes for early detection of BC in this target population, and for increasing their level of knowledge about BC and BSE practice.

In the present study, all the variables correlated with participants' practice of BSE including all aspects of BC knowledge, with the highest correlation with knowledge of BSE and the lowest with knowledge of BC warning signs. Our findings are similar to those of a study carried out

among Palestinian student nurses concerning BSE, which found a statistically significant correlation between overall knowledge and practice of BSE (Ayed et al., 2015; Parsa et al., 2011).This point to the importance of providing female students with sufficient knowledge regarding BC and BSE skills. Indeed, it is recommended to revisit the students' curricula and enrich them with content concerning BC and BSE that could increase their awareness and reinforce their practice of BSE.

This study showed that students with a positive attitude and a higher level of knowledge in regard to BSE, BC warning signs and breast screening programmes were found to report better practice of BSE. This is consistent with findings of previous studies, suggesting that women with good knowledge of BC symptoms and screening methods had higher performance rates of BSE (Akhtari-Zavare et al., 2014; Parsa et al., 2011).This suggests that nurses and nurse educators should promptly provide women with knowledge about BC warning signs, risk factors, breast screening programmes and BSE, including the appropriate time to perform BSE, its frequency and techniques. This will make women aware of their own breast anatomy, normal and abnormal findings and may increase their practice of BSE. Thus, women will be able to identify BC at earlier stages.

Regarding the predictors of BSE, this study found three: attitude toward BSE, knowledge of BC risk factors, and knowledge about BSE. Similar results were found in the literature (Freitas & Weller, 2016; Al-Sharbatti, et al., 2013; Early, et al., 2011;; Parsa, et al., 2011),that positive attitudes; greater knowledge about BC and screening methods are significant predictors of practicing BSE. Indeed, the findings of our study are consistent with a cross-sectional study conducted among female university students in Korea, which revealed that knowledge of BC is one of the predictors of BSE(Shin et al., 2012).Similar to our results, a Brazilian study identified knowledge of BC risk factors as a predictor of performing BSE (Freitas & Weller, 2016).It seems that poor knowledge and negative attitude result in the low practice of BSE among female students. Therefore, campaigns to emphasize awareness of BC and the importance of BSE are required. Also, information about BC risk factors and warning sign should be emphasized to motivate BSE performance.

The results of this study are subject to certain limitations, including the inability to generalize the findings as participants were drawn from only one university. The use of self-reported questionnaire constitutes another limitation, as it is susceptible to recall bias. Future studies might therefore include a sample from various universities across the country, perhaps comparing the results between private and government universities. Also, using more objective methods for evaluating long-term compliance with BSE recommendations, such as diaries, are strongly recommended. Nevertheless, this study has made a major contribution by shedding light on a very important topic with international interest, and through focusing on an important age group university students.

Implication for practice

In light of the current results, the implementation of educational programmes on BC and BSE aiming at increasing women breast cancer awareness, as well as Practice of BSE, is urgently needed. Healthcare providers in particular nurses should emphasize and promote the extension of educational programmes on BC and the importance of early detection of BC in schools, universities and communities. The results from this study can be used by faculties of health sciences and educators to adopt and develop new curricula, activities and events that emphasize breast health awareness, screening behaviors and positive attitudes. Finally, the mass and social media should be utilized to spread correct and relevant information about BC and the importance of BSE to all women worldwide.

Conclusion

This study attempted to evaluate the level of Jordanian female undergraduates' practice of BSE, and to identify the predictors that affect this practice. The findings showed participants practiced BSE less frequently and that positive attitudes, higher level of knowledge of BSE, BC warning signs and breast screening programmes were found to be predictors of BSE. The study pointed to an urgent need to increase female students' breast health awareness through extensive educational programmes at university and community level, to provide them with knowledge of BC(risk factors, warning signs), and the benefits of BSE.

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