

Factors Associated with Breast Self-Examination Among Jordanian Women

Wasileh Petro-Nustus, Sc.D., R.N., and
Blanche I. Mikhail, DNSc, R.N., C.N.S.

Abstract The purpose of this cross-sectional, correlational, descriptive study was to investigate factors and beliefs that may be related to the practice of breast self-examination (BSE) among a group of Jordanian women. The sample consisted of 519 women from two major universities in Jordan. About 36% of the sample were university employees and 64% were graduate and undergraduate students. Stratified random sampling was used to enroll the undergraduate students while graduate students and employees were selected by convenience sampling. The study instrument was an adapted version of Champion's Revised Health Belief Model Scale (CRHBMS). The results were analyzed using a chi-square test and a stepwise multiple regression. The main findings indicate that although the majority of the sample population (67%) had heard/read about BSE, only a quarter of them reported that they had ever practiced BSE in the previous 12 months, and only 7% had performed it on a regular monthly basis. Confidence, motivation, susceptibility, and fewer barriers were variables that showed a positive association with BSE practice in the previous year, while benefits, susceptibility, and motivation influenced the intention to perform BSE in the future. Women's age, level of education, having heard or read about breast tumors, and personal history of breast tumors were also found to be significant predictors of BSE practice.

Key words: BSE, screening, Jordanian women.

Wasileh Petro-Nustus is Dean and Associate Professor, The Hashemite University, Zarka Jordan. Blanche I. Mikhail is Professor and Graduate Program Coordinator, California State University, Bakersfield, California.

Address correspondence to Wasileh Petro-Nustus, Faculty of Nursing, The Hashemite University, P.O. Box 13133, Zarka, Jordan. E-mail: wasipn@hu.edu.jo

Cancer is one of the leading causes of mortality in Jordan (Ministry of Health, 1996). The breast is considered the primary site of cancer among women as breast cancer constitutes 29% of all female cases reported in the country (Ministry of Health, 1999). Statistics in the 1998 Jordan Cancer Registry indicated that around half of the women with breast cancer were diagnosed before the age of 50, while data from Western countries indicate the risk is significantly higher after the age of 49 (Ministry of Health, 1999; American Cancer Society, 2000a).

Breast self-examination (BSE) is an important screening measure for detecting breast cancer. There is evidence that women who correctly practice BSE monthly are more likely to detect a lump in the early stage of its development, and early diagnosis has been reported to influence early treatment and to yield a better survival rate (American Cancer Society, 2000b). For example, in a randomized, controlled assessment of the effectiveness of international screening programs for breast cancer in Scandinavian countries, it was found that mortality had fallen by 31% after 7 years for women aged 40–74 at the beginning of the trial (Nystrom, 2000). Unfortunately, despite the benefits of regular BSE, few women actually examine themselves; in fact, a majority do not even know how to do a BSE (Stamler, Thomas, & Lafreniere, 2000; Al-Abadi, 2001).

Regular self-examination among diverse population has been associated with many factors. Among them are the following: older age (McPhee, Stewart, Brock, Bird, Jenkins & Pham, 1997; Ajayi & Adebamowo, 1999; Smiley, McMillan, Johnson, Ojeda, 2000); greater knowledge of BSE and breast cancer (Savage & Clarke, 1996; Champion & Menon, 1997; Budden, 1998; Ajayi & Adebamowo, 1999; Smiley et al., 2000); availability of health insurance (McPhee et al., 1997; Al-Abadi, 2001);

a family history of breast cancer (Budden, 1998; Absetz, Aro, Rehnberg, & Sutton, 2000); marriage (McPhee et al., 1997; Al-Abadi, 2001); and beliefs about breast cancer and BSE (Budden, 1998; Smiley et al., 2000; Stamler et al., 2000; Al-Abadi, 2001).

The purposes of this study were to assess beliefs about breast cancer and BSE and to identify factors related to the practice of BSE in a group of Jordanian women.

THEORETICAL FRAMEWORK

The Health Belief Model (HBM) has been used in several studies as a theoretical framework to study BSE and other breast cancer detection behaviors (Hoeman & Ku, 1996; Barron, Houfek & Foxall, 1997; Mikhail & Petro-Nustas, 2001; Al-Abadi, 2001), and it is the conceptual framework for this study. The model stipulates that health-related behavior is influenced by a person's perception of the threat posed by a health problem and by the value associated with his or her action to reduce that threat (Becker, 1978).

As initially introduced by Hochbaum, Leventhal, Kegels and Rosenstock in the 1950s, the HBM included the following four concepts: (1) perceived personal exposure to a health condition (susceptibility); (2) perceived personal harm from the condition (seriousness); (3) perceived positive attributes of an action (benefits); and (4) perceived negative aspects related to an action (barriers) (Rosenstock, 1966). Later, Rosenstock, Strecher & Becker (1988) identified the following additional concepts: health motivation, which is defined as the belief and degree of interest in general health; and confidence, which is the conviction that the individual has that an action will achieve a desirable outcome.

In addition, a cue to action (stimulus) is needed to trigger protective behavior. Cues to action could be internal, such as perception of a body state, or external, such as the influence of mass media. Cues, along with demographic and structural variables, may trigger an individual's perception of susceptibility and seriousness and in turn may influence his or her behavior with regard to the desired practice.

According to the HBM, therefore, a woman who perceives that she is susceptible to breast cancer and that breast cancer is a serious disease would be more likely to perform regular breast examinations. Similarly, a woman who perceives more benefits of and fewer barriers to BSE would be more likely to practice BSE. A woman who has an internal cue (body perception) or who has been exposed to an external cue (e.g., the positive influence of a health care provider or the media) would also opt for BSE, as would a woman who wants to improve her health and who is confident of positive results (Champion, 1993).

LITERATURE REVIEW

Several researchers have used the HBM in their investigations of factors associated with BSE practice (Lu, 1995; Savage & Clarke, 1996; Hoeman & Ku, 1996; Champion & Menon, 1997; Foxall, Barron & Houfek, 1998). Lu (1995) conducted a study using the HBM and Bandura's social learning theory on a sample of Asian women living in China to identify barriers that hinder the practice of BSE. Lu used a 38-item 5-point Likert Scale survey developed by Champion on 174 women with a mean age of 31 years. The main findings were the following: 15% examined themselves monthly; 48% reported never having performed a BSE; 50% of the sample had no opinion whatsoever on perceived susceptibility to and seriousness of breast cancer; more than 80% recognized the efficacy of BSE although they did not do it; and 10% of the variance on BSE frequency was accounted for by perceived competence. Lu also noted a tendency among the women to attribute the cause of cancer to fate.

Savage & Clarke (1996) used a theoretical framework derived from the theory of reasoned action and the HBM to study the intention to practice BSE among women aged 50–70 years living in Victoria, Australia. They found that intentions were associated with self-assurance, knowledge of breast cancer issues, concern about getting breast cancer, and employment status.

Hoeman & Ku (1996) conducted an exploratory study to find how cultural beliefs and understanding may influence participation in early detection. The HBM was used as a framework for categorizing the data. The sample consisted of 23 Chinese women with a mean age of 30 years who attended a university clinic. The results indicated that cultural beliefs about modesty, husband's involvement, and the self-care relationship between health and bodily functions influenced women's use of early detection techniques. In fact, early detection was not a clear concept to the women in the sample, in that 80% believed that if they performed monthly breast self-examination they would prevent the occurrence of breast cancer. Moreover, the women did not believe they were particularly susceptible to breast cancer nor did they perceive its seriousness. A "fatalistic belief" of prevention emerged from the analysis, as again, the women tended to relate the occurrence of cancer to fate. Likewise, their reluctance to practice preventive health measures in the absence of illness was found to influence their practice of BSE, indicating a previously held perception that only sick people need to visit doctors.

Champion & Menon (1997) studied variables associated with mammography and breast self-examination among a convenience sample of low-income African American women aged 45–60 years living in a large midwestern

metropolitan area in the United States. Data were collected over a period of 18 months utilizing predisposing, enabling, and need variables from Anderson's theoretical framework (Anderson, Aspegren & Jazon, 1998) along with the HBM. The HBM framework included variables of perceived susceptibility, benefits, barriers, confidence, knowledge, physicians' recommendations, demographic characteristics, past experiences, and health insurance. Variables that significantly predicted either frequency or proficiency of BSE included susceptibility, benefits, confidence, knowledge, barriers, and regular visits to a physician. Possible implications for clinical practice included emphasizing screening and education.

Foxall et al. (1998) compared the BSE practices and health beliefs of 230 African American nurses (AAN) and 78 Caucasian nurses (CN). They found that 42% of the AAN had performed BSE 12 or more times during the year while just 20% of the CN had done so. The AAN were more likely to consider self-examination beneficial and felt more confident about doing it. They also had a positive attitude toward BSE and reported few barriers to its practice. Caucasian nurses, on the other hand, reported more barriers.

Other researchers have studied BSE practice using different approaches. Budden (1998) conducted a survey on a sample of 171 female Australian registered nurses aged 20–65 who worked in acute or long-term care to investigate their BSE practice and their teaching of it to their patients. Although 93% reported performing a BSE in the previous 12 months, less than half had done so on a monthly basis. The major reason cited for not performing BSE was forgetfulness (57%). The majority (81%) stated they did not include the teaching of BSE in their nursing care, although nurses who performed a BSE monthly were found to be more likely to teach it. This implies that if BSE is emphasized in the workplace and in undergraduate course work, nurses may be more likely to teach it to their patients.

In yet another research study, Ajayi & Adebamowo (1999) conducted, face-to-face interviews with a cross-sectional sample of 500 Nigerian women age 20 and older regarding the knowledge, attitudes, and practices related to breast cancer. Forty-one percent of the respondents had heard or read about breast cancer, but only a few of them were aware of the signs of its early stages. Knowledge about risk factors and perception of risk was lacking. The media was a major source of the respondents' information about the disease. Younger women in the study believed breast cancer was more common among older women but that it was curable when diagnosed at an early stage. The researchers concluded that subjects' lack of awareness contributed to women's late presentation to receive health care. Thus the researchers emphasized the need for

appropriate, culturally sensitive health education programs.

Research also indicates that women's practice of BSE is influenced by culture. Facione, Giancarlo, & Chan (2000) conducted a focus group study on 45 Chinese-American women to answer the question, How do women decide whether and when to seek an evaluation of breast symptoms that may signal breast cancer? The researchers found unique to these Chinese American women was a sense of invulnerability to breast cancer, by which they link the occurrence of cancer to tragic luck, and that they were very likely to delay reporting symptoms and favored using Chinese medicine before turning to Western therapies. The authors suggested that health care providers must establish guidelines for the early detection of breast cancer in this population.

In Jordan, a country in the Middle East with a population of 4.5 million, one master's thesis (Al-Abadi, 2001) is the only research conducted to date on factors related to women's belief in and practice of BSE. Furthermore, the authors were not able to locate any published research in neighboring Arab countries. This study was therefore conducted to address gaps in the literature regarding the breast health of Jordanian women.

METHODS

A cross-sectional, descriptive, correlational design was used with a precoded self-administered questionnaire. The Statistical Package for Social Sciences (SPSS) was used to analyze the data.

Instrument

Champion's revised Health Belief Model Scale (CRHBMS) was used as the tool for this study (Champion, 1993; Mikhail & Petro-Nustus, 2001). The authors translated and adapted the CRHBMS into Arabic and then tested it for validity and reliability. Content validity was assured by an expert panel. The Alpha reliability ranged from 0.65 to 0.89 which was similar to that of Champion's findings (1993). A detailed description of the translation and adaptation of CRHBMS can be found in another published article (Mikhail & Petro-Nustus, 2001).

The adapted version of CRHBMS consists of a total of 43 items grouped in six subscales as follows: susceptibility (five items, $\alpha = 0.85$); seriousness (seven items, $\alpha = 0.81$); benefits (six items, $\alpha = 0.79$); barriers (seven items, $\alpha = 0.77$); health motivation (seven items, $\alpha = 0.65$) and confidence (11 items, $\alpha = 0.89$). A 5-point Likert Scale format with code 1 (strongly disagree) and code 5 (strongly agree) was used for all items. Construct and predictive validity of the adapted scale were also tested and found to be acceptable (Mikhail & Petro-Nustus, 2001).

Sample

The sample consisted of 519 female students and employees at two public universities: the University of Jordan (UJ) in Amman and the Hashemite University (HU) in Zarka. Employees made up 35.6% of the sample and undergraduate and graduate students made up 64.4%. To be eligible to enroll in the study, the women had to be 18 years of age or older and could not be pregnant or lactating.

All employees meeting the above criteria were invited to participate. Seventy-four percent of the women employed at HU ($n = 111$), and 49% of the 211 females employed at UJ participated, yielding an overall response rate of 62%. The three research assistants hired and trained to collect data visited the employees at their workplaces. They explained the confidentiality, benefits, risks, and future implications of the research. Questionnaires were then left with those who verbally consented to participate. Employees were told to leave the completed questionnaires with the department/unit secretary. The research assistants collected the questionnaires on the following day.

Undergraduate students from HU were enrolled by means of stratified random sampling. Students were stratified based on the schools they attended and on their levels of study at the university. A list of all courses offered in the fall semester of 1999–2000 was obtained from the university registrar. Four to six classes were chosen randomly from each faculty (school). The research assistants then distributed the self-administered questionnaires to 240 students in the selected classes. The assistants gave the students a brief description of the purpose of the study, its benefits, risks, and significance. Participation was totally voluntary. Students were asked not to write their names on the questionnaires and were assured that the information they provided would be confidential and used only for the purpose of the study. The response rate was 65%.

Graduate students were selected from UJ only because HU is newly established and does not yet have an adequate number of females in its graduate programs. All those studying at UJ ($n = 145$), with the exception of those who were in the medical or health sciences, were invited to participate. Ninety-four subjects completed the questionnaire, a response rate of 65%.

RESULTS

Demographic Characteristics

The sample population ranged from 18 to 59 years old ($M = 25$; $SD = 7.24$). A total of 5% of the sample listed high school as the highest level of education, while 41%

had some university education and 16% were pursuing graduate studies. Single women made up 78% of the sample with 19% being married and 3% divorced or separated. A family history of breast cancer was recorded by 9%, 2% stating that it had affected their mothers, 2% a sister, and 3% an aunt. About 4% of the sample indicated that they had a personal history of breast cancer.

Practice, Intention to Practice, and Sources of Information

Although 67% of the participants reported that they had heard about BSE, only 26% of them indicated they themselves practiced BSE in the previous 12 months, and only 7% stated that they performed BSE on a regular monthly basis. Others reported performing BSE every 2–3 months (9%), once every 6 months (5%) and once a year (6%). A total of 73% of the participants indicated that they had never performed a BSE. When asked about their intention to practice BSE in the coming year, 67% of them said that they would consider examining themselves regularly.

A majority of the sample (82%) reported that they had heard or read about breast tumors. Television and/or radio programs were identified as the main source of information on breast tumors and BSE by 62% and 42% of the participants, respectively. Printed materials were also a major source of information about breast tumors (47%) and about BSE (37%). Health professionals (doctors/nurses) were mentioned as a source of information on breast tumors and BSE, 11% and 12%, respectively.

Participants' Health Beliefs

Average responses to the items on the six belief scales are summarized in Table 1. More than one-third of the sample (37%) did not believe they were susceptible to breast cancer, while about 43% were not sure. One-quarter of the participants did not believe breast cancer is a serious illness. A total of 81% of the sample recognized the benefits of BSE, while only 26% reported having confidence in their ability to perform BSE correctly. Fifteen percent of the participants agreed that there were barriers that prevent them from examining themselves, while the same proportion of women were unsure of the presence of barriers. Twenty-eight percent were either not motivated to perform BSE or did not show any concern about it.

Relationship between Beliefs and BSE Behavior

Tables 2 and 3 present the simple bivariate correlation of each subscale score with the actual frequency of BSE practice in the last year and the intended frequency of BSE practice in the next year. Significant and positive

TABLE 1. Participants' Average Responses to the HBM Scales

Scale	Strongly Disagree (%)	Disagree (%)	Neither Agree nor Disagree (%)	Agree (%)	Strongly Agree (%)
Susceptibility (SUS)	11.4	25.4	43.0	17.5	02.8
Seriousness (SER)	06.1	19.9	20.0	36.0	17.9
Benefits (BEN)	01.7	05.3	12.1	55.6	25.4
Barriers (BAR)	26.8	42.6	15.2	12.0	03.4
Confidence (CON)	13.4	36.0	24.1	23.3	03.2
Motivation (MOT)	03.3	12.1	12.8	39.7	32.1

TABLE 2. Stepwise Multiple Regression of HBM Variables on the Frequency of BSE Practice

Variable	Beta of Current Scale	Beta of Original Scale	Simple Correlation	T	P
CON	0.34	0.34	0.37	8.32	< 0.01
BAR	-0.24	-0.21	0.29	5.49	< 0.01
SUS	0.12	0.15	0.15	2.84	< 0.01
MOT	-0.10	0.14	0	2.39	0.017
BEN	-0.01	0.09	0.08	0.240	0.810
SER	0	0	0.01	0.009	0.993

(R² = 21%, F = 21.90 Sig.F = <0.01, N = 519).

TABLE 3. Stepwise Multiple Regression of HBM Variables on the Intended Frequency of BSE Practice

Variable	Beta	Simple Correlation	T	P
BEN	0.14	0.19	3.09	0.002
SUS	0.14	0.15	3.11	0.002
MOT	0.09	0.14	1.95	0.05
BAR	-0.07	0.14	1.51	0.13
CON	-0.01	0.02	-0.317	0.75
SER	0	0.01	0.009	0.993

(R² = 0.07, F = 6.279, Sig.F = <0.01, N = 519).

correlations were found between the frequency of BSE practice in the past 12 months and perceptions of confidence in practicing BSE ($r = 0.37, p < 0.01$) and susceptibility to breast cancer ($r = 0.15, p < 0.01$). As perceptions of susceptibility to breast cancer and confidence in performing BSE increased, the frequency of practicing BSE increased as well. A significant negative correlation was also found between perception of barriers and BSE practice ($r = -0.29, p < 0.01$) in that BSE practice increased as barriers decreased. Additionally, the intended frequency of BSE practice was significantly positively correlated with perceived benefits of BSE ($r = 0.19, p < 0.01$) and motivation to practice BSE

($r = 0.14, p < 0.01$), but negatively correlated with perceived barriers that inhibit the practice of BSE ($r = -0.14, p < 0.01$).

The frequency of BSE in the previous 12 months and the intention to practice it in the next year were regressed on all belief variables in Tables 2 and 3. The combined independent variables accounted for 21% of the variance in BSE practice in the previous year. Susceptibility, motivation, and confidence contributed significantly to the variance in practice. In contrast, the variables of benefit and seriousness were not significant. ANOVA testing on the same variables explained how scales of confidence ($f = 20.75, p < 0.01$), barriers ($f = 12.50, p < 0.01$), and susceptibility ($f = 4.45, p < 0.01$) showed significant differences in the frequency of BSE practice in the past 12 months. To investigate the source of differences among these variables, Sheeffe testing was administered. Findings revealed that the confidence and barrier scales were the most important factors influencing women's practice of BSE, especially for those who performed BSE on a regular monthly basis. The susceptibility scale, on the other hand, mostly influenced BSE practice among women who examined themselves every 6 months.

In terms of the intention to practice BSE in the coming year, the stepwise multiple regression showed that the benefits, susceptibility, and motivation scales accounted for about 7% of the variance. All Beta values for each scale in both Tables 2 and 3 were positive except for barriers, which was negative. This means that as barriers increased, practice and intended practice decreased. Results of the ANOVA test showed that perceptions of barriers ($f = 14.13, p < 0.01$), benefits ($f = 10.96, p < 0.01$), confidence ($f = 4.82, p < 0.01$), and motivation ($f = 3.86, p < 0.01$) had significant effects on intention to practice BSE in the next year.

Relationship Between Demographics, Cues to Action, and BSE Practice

Table 4 presents the association between demographic variables and cues to action, and the frequency of BSE practice in the previous year. A chi-square was used to

TABLE 4. Results of Chi-Square Test of Significance for the Demographic and other Variables with BSE Practice in the Previous Year

Variable	X ²	df	P
Personal history of breast cancer	66.49	4	0.001
Ever heard/read about breast tumors	95.35	8	0.001
Marital status	15.30	4	0.004
Ever heard/read about BSE	15.05	4	0.005
Health insurance	10.65	4	0.031
Age	38.35	24	0.032
Education	25.58	12	0.012
Family history of breast tumors	3.34	4	0.502

test the association of BSE with age, education, marital status, personal history, family history, health insurance, and ever hearing or reading about breast tumors or BSE. The variables personal history of breast tumors, ever hearing or reading about breast tumors, and ever hearing or reading about breast self-examination were significantly associated ($p < 0.001$) with the frequency of BSE practice in the previous year. Older women, those with more than a high school education, and those with health insurance practiced BSE significantly more than other women ($p < 0.05$). Table 5 presents the association between the demographic variables, cues to action, and the intended frequency of BSE practice in the next year. Results showed that only participant's age, education, and ever hearing or reading about tumors had a significant association ($p \leq 0.05$) with the frequency of intended BSE practice in the next year. In short, it was evident that older women practiced BSE more frequently in the previous year and that BSE was practiced by those with more than a high school education and by those who had ever heard or read about breast tumors.

In addition, a stepwise multiple regression was performed to investigate the impact of all the demographic variables and cues to action simultaneously. Table 6 shows a multiple R of 0.36 ($p = 0.01$) with 13% of the variance accounted for by all the variables in the table.

TABLE 5. Chi-square Test of Significance for the Demographic and other Variables with BSE Intended Practice

Variable	X ²	df	P
Marital status	10.40	4	0.03
Age	36.92	24	0.04
Ever heard/read about breast tumors	16.35	8	0.04
Personal history of breast tumors	08.52	4	0.07
Ever heard/read about BSE	05.49	4	0.24
Family history of breast tumors	05.01	4	0.29
Health insurance	02.60	4	0.62

TABLE 6. Stepwise Multiple Regression of the Demographic and other Variables on BSE Practice (Dependent) in the Previous Year

Demographic Variables	R	R ²	R ² Change	F	P
Ever heard/read about breast tumors	0.289	0.083	0.083	42.9	< 0.001
Personal history of breast tumors	0.325	0.106	0.022	11.7	< 0.001
Age	0.349	0.122	0.16	8.81	< 0.01
Education	0.364	0.132	0.01	5.63	0.01
Ever heard/read about BSE	0.366	0.134	0.001	0.72	0.39
Marital status	0.367	0.135	0.001	0.55	0.46
Health insurance	0.367	0.135	0.000	0.01	0.92
Family history of breast tumors	0.367	0.135	0.000	0.01	0.94

The variable age, however, accounted for most of the variance (12%) in the frequency of BSE in the previous year. Both variables concerning participants' personal history of breast tumors and prior hearing or reading about breast cancer did not contribute to much difference in the variance of BSE practice in the past year (i.e., 1% and 0.08%, respectively). None of the other demographic variables or cues to action contributed significantly to the variance in BSE practice in the previous year.

In another stage of the analysis, the stepwise multiple regression was conducted to determine which of the independent demographic variables did actually significantly contribute to the variance of the intended BSE, the results revealed that none of the variables in the regression model showed any significant contribution to the variance in the intended frequency of BSE practice in the next year.

DISCUSSION AND CONCLUSION

The literature supports the argument that regular practice of BSE influences treatment, prognosis and survival rates (Nystrom, 2000; Facione, Giancarlo & Chan, 2000). Nevertheless, only one-quarter of women in this sample reported ever practicing BSE in the previous 12 months. A more disturbing finding was that only 7% of participants reported practicing BSE on a regular monthly basis while 9% stated they examined themselves every two to three months. Similarly, Budden (1998) and Al-Abadi (2001) reported that less than half of study participants actually practiced BSE monthly. A study done by Fung (1998) also indicated that less than half the sample examined themselves and only 16% of those did so regularly. In contrast, Smiley et al. (2000) and Petro-Nustas (2001) found that the majority of older women in

their studies performed breast screening activities on a more regular basis.

Given that 67% of the woman in this study reported that they had ever heard or read about BSE, the very low proportion of them that actually practiced BSE attests to the fact that knowledge about BSE per se is by no means sufficient to trigger practice. Commenting on similar findings, Ajayi & Adebamowo (1999), Smiley et al. (2000) and Al-Abadi (2001) indicated that it is not enough to have information about BSE. It is also of vital importance to provide BSE instructions with an emphasis on proficiency and long-term practice. Because public campaigns to educate women in Jordan about breast cancer and BSE are lacking, what the women have heard or read might not be adequate to educate them sufficiently and to motivate them to practice.

Seriousness and benefits were not significant in explaining BSE performance in the previous 12 months, but increased confidence, susceptibility, motivation, and reduced barriers were significantly associated with it. This result is similar to the findings reported by Champion (1993, 1997).

Although a significant proportion of the women in this study perceived breast cancer to be serious, most of them did not perceive themselves as being susceptible. This could be due to a lack of education on breast cancer and BSE practice. Another factor that may have contributed to this finding is Jordanian women's belief in fatalism, i.e., that susceptibility to breast cancer is the will of God. This belief could have moderated the effect of perceived seriousness of the disease on BSE practice. In other words, if a woman is destined to get breast cancer, then detecting it in an early or late stage will not matter. Another fatalistic belief is that talking about a disease will cause its onset. For women who believe that, the subject of breast cancer is taboo. Such fatalistic expressions were also reported in other cultures (Ajayi & Adebamowo, 1999; Facione, Giancarlo & Chan, 2000; Smiley et al., 2000).

The significance of the variables of confidence and barriers related to BSE performance in the previous year is consistent with the results of other studies (Hoeman & Ku, 1996; Champion & Menon, 1997; Ajayi & Adebamowo, 1999; Erblich, Bovbjerg & Valdimarsdottir, 2000; Smiley et al., 2000; Al-Abadi, 2001). This highlights the importance of introducing educational programs to increase confidence and of identifying barriers to BSE for Jordanian women. Intervention strategies should focus on teaching women how to make BSE a monthly habit. Strategies such as videotapes, talks by women who have been treated for breast cancer, use of breast models, and one-on-one demonstrations should all be encouraged.

It is interesting to note that although perceived barriers were found to significantly influence BSE practice in the

previous year, they were not significant in explaining the intention to practice BSE in the future. Other investigators, however, found that items on the barrier scale did account for the variance between future performance and nonperformance (Hoeman & KU, 1996; Ajayi & Adebamowo, 1999; Erblich, Bovbjerg & Valdimarsdottir, 2000; Smiley et al., 2000; Al-Abadi, 2001).

There are many sorts of barriers. Tang, Solomon, Yeh & Worden (1999) found that shyness and embarrassment influenced communication with Jordanian women. In addition, openness about sexuality, prevention orientation, and utilization of Western medicine were also found to influence the practice of BSE. Thus, the authors of this paper believe further research is needed to identify barriers to BSE for Jordanian women, which will allow for planning and implementing appropriate strategies to reduce these barriers. Qualitative studies may be helpful in that respect.

Several researchers (Budden, 1998; Ajayi & Adebamowo, 1999; Al-Abadi, 2001) have emphasized the role health care providers can play in educating and training women in BSE. Routine breast checks by providers may help women feel at ease and become more confident about performing BSE, and may provide knowledge about its benefits.

Although the benefits variable was not significantly associated with BSE practice in the previous year, it was significantly associated with the intention to practice BSE in the future. Again, this reaffirms the need for well-designed awareness programs that underline the benefits of preventive care and early screening, given the evidence that women who believed they would receive more benefits from a health behavior were more likely to perform that behavior (Ajayi & Adebamowo, 1999; Stamler et al., 2000; Al-Abadi, 2001).

The results of the multiple regression analysis indicated that confidence, barriers, susceptibility, and motivation explained 21% of the variance between performance and nonperformance in the previous 12 months, while benefits, susceptibility, and motivation accounted for 7% of the variance in the intention to practice BSE in the future. This finding strongly indicates that further research is needed to investigate issues related to women's motivation to perform preventive behaviors and to their confidence and trust in the overall health care system. This is vastly important for Jordanian women because breast cancer is considered their main cause of death (Ministry of Health, 1999), and because younger Jordanian women have been found to be at even greater risk for breast cancer (Petro-Nustus, Norton & Al-Masarweh, 2002).

The independent effect of the demographic variables and cues to action were investigated by means of the chi-square test of significance. A woman's age and education,

personal history of breast cancer, and ever hearing or reading about breast tumors were all found to be significantly associated with BSE performance in the previous year and with the intention to practice BSE in the future. These findings are consistent with those of previous research. (McPhee et al., 1997; Champion & Menon, 1997; Ajayi & Adebamowo, 1999; Absetz, Aro, Rehnberg & Sutton, 2000; Smiley et al., 2000; Al-Abadi, 2001).

Demographic variables and cues to action were also analyzed simultaneously using a stepwise multiple regression. Older age, completion of high school or a higher degree, having heard or read about breast tumors, and personal history of breast tumors were found to strongly influence BSE practice in the previous 12 months.

That of the 82% of the sample that reported ever hearing or reading about breast tumors the majority (62%) mentioned television/radio as their source of information underscores the potential effectiveness of the media in modifying health behavior. Television and radio were also cited by Jordanian men as the main influence on their attitudes toward fertility and family planning issues (Petro-Nustas, 1999). It is essential that these media programs be simple to understand and that they provide complete and accurate information.

An alarming finding was that very few women (11%) mentioned health care providers as their source of information on breast tumors and BSE. This was surprising to the investigators, since health care providers in Jordan are presumed to understand the magnitude of the problem of breast cancer in the country and are expected to play a significant preventive role. This role is especially important for diseases where early detection has the potential to improve cancer outcomes (Ajayi & Adebamowo, 1999; Facino, Giancarlo & Chan, 2000). Furthermore, early detection is essential in countries such as Jordan where resources are extremely limited. Therefore, the authors recommend further investigation of the preventive role health care providers play in the community, including the cost-effectiveness of designing and implementing preventive care.

LIMITATIONS

One limitation of this study was related to the selection method used to enroll the participants. A convenient sample of graduate students and employees was used. The choice of this method was mainly due to the small number of females in both categories. This could have created a selection bias in that only those women who have an interest in preventive health behaviors like BSE agreed to participate.

Another limitation is that the study included a fairly large number of young women. The inclusion of more

women in the older age groups could yield a larger proportion of women who are currently practicing BSE. Further research is recommended using a larger sample size with women in all age groups, particularly those of menopausal age. Comparisons of belief in and practice of BSE could then be made for younger and older women. The results could influence the planning of specific, life-saving interventions and strategies for Jordanian women.

ACKNOWLEDGMENTS

The investigators thank the Dean of Academic Research at the Hashemite University for funding this study. Moreover, the authors would like to acknowledge the Fulbright Scholar Program for sponsoring the second author during the time the study was conducted.

REFERENCES

- Absetz, P., Aro, A. R., Rehnberg, G., & Sutton, S. R. (2000). Comparative optimism in breast cancer risk perception: effects of experience and risk factors knowledge. *Psychology, Health and Medicine*, 5, 347-343.
- Ajayi, I. O., & Adebamowo, C. A. (1999). Knowledge, belief, attitudes towards breast cancer in Southwestern Nigeria. *Cancer Strategy*, 1, 20-24.
- Al-Abadi, N. (2001). Factors influencing BSE practice among Jordanian nurses. Unpublished master's thesis. Jordan University for Science and Technology, Irbid, Jordan.
- American Cancer Society (2000a). How has the occurrence of breast cancer changed over time? *Breast Cancer and Figures*, (pp. 1999-2000). Author.
- American Cancer Society (2000b). National breast cancer awareness month: Fast facts. Author. Retrieved January 22, 2001. Available: http://www.cancer.org/NBCAM_fastfacts.html.
- Anderson, I., Aspegren, K., & Jazon, L. (1998). Mammographic screening and mortality from breast cancer: the Malmo mammographic screening trial. *British Medical Journal*, 297, 943-948.
- Barron, C. R., Houfek, J. F., & Foxall, M. J. (1997). Coping style, health beliefs, and breast self-examination. *Issues in Mental Health Nursing*, 18, 331-350.
- Becker, M. (1978). The health belief model and sick role behavior. *Nursing Digest*, 6, 35-40.
- Budden, L. (1998). Registered nurses' breast self-examination practice and teaching to female clients. *Journal of Community Health Nursing*, 15(2), 101-112.
- Champion, V. L. (1993). Instrument refinement for breast cancer screening behaviors. *Nursing Research*, 42(3), 138-143.
- Champion, V. L. (1997). Instruments for measuring breast self-examination. In M. Frank-Stromberg & S. J. Olsen (Eds.), *Instruments for Clinical Health Care Research* (2nd ed., pp. 389-400). Boston: Jones and Barlett Publishers.
- Champion, V., & Menon, U. (1997). Predicting mammography and breast self-examination. *Psychology of Women Quarterly*, 16, 81-96.

- Erblich, J., Bovbjerg, D. H., & Valdimarsdottir, H. B. (2000). Psychological distress, health beliefs, and frequency of breast self-examination. *Journal of Behavioral Medicine, 23*(3), 277–292.
- Facione, N. C., Giancarlo, C., & Chan, L. (2000). Perceived risk and help seeking behavior for breast cancer. *Cancer Nursing, 23*(4), 256–264.
- Foxall, M. J., Barron, C. R., & Houfek, J. (1998). Ethnic differences in breast self-examination practice and health beliefs. *Journal of Advanced Nursing, 27*, 419–428.
- Fung, S. Y. (1998). Factors associated with breast self-examination behavior among Chinese women in Hong Kong. *Patient Education and Counseling, 33*(3), 233–243.
- Hoeman, S. P., & Ku, Y. L. (1996). Health beliefs and early detection among Chinese women. *Western Journal of Nursing Research, 15* (5), 518–534.
- Lu, Z. J. (1995). Variables associated with breast self-examination among Chinese women. *Cancer Nursing, 8*(1), 29–34.
- McPhee, S. J., Stewart, S., Brock, K. C., Bird, J. A., Jenkins, C. N. H., & Pham, G. Q. (1997). Factors associated with breast and cervical cancer screening practices among Vietnamese American women. *Cancer Detection and Prevention, 21*(6), 510–521.
- Mikhail, B. I., & Petro-Nustus, W. (2001). Transcultural adaptation of Champion's Health Belief Model Scales. *Image: the Journal of Nursing Scholarship, 33*(2), 173–179.
- Ministry of Health (1996). National study on causes of death. Amman, Jordan: Author.
- Ministry of Health (1999). National cancer registry. 1997 Report. Amman, Jordan: Army Printing Press.
- Nystrom, L. (2000). How effective is screening for breast cancer? *British Medical Journal, 32*(7262), 647–649.
- Petro-Nustus, W. (1999). Men's knowledge of and attitudes toward birthspacing and contraceptive use in Jordan. *International Family Planning Perspectives, 25*(4), 181–185.
- Petro-Nustus, W. (2001). Young Jordanian women's health beliefs about mammography. *Journal of Community Health Nursing, 18*(3), 177–194.
- Petro-Nustus, W., Norton, M., & Al-Masarweh, I. (2002). Risk factors correlated with breast cancer in Jordanian women. *Image. The Journal of Nursing Scholarship, 34*(1), 19–25.
- Rosenstock, I. M. (1966). Why people use health services. *Milbank Memorial Fund Quarterly, 44*, 94–121.
- Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education Quarterly, 15*, 175–183.
- Savage, S. A., & Clarke, V. (1996). Factors associated with screening mammography and breast self-examination intentions. *Health Education Research: Theory and Practice 11*, 409–421.
- Smiley, M. R., McMillan, S. C., Johnson, S., & Ojeda, M. (2000). Comparison of Florida Hispanic and Non-Hispanic Caucasian women in their health belief related to breast cancer and health locus of control. *Oncology Nurse Forum, 27*(6), 975–984.
- Stamler, L. L., Thomas, B., & Lafreniere, K. (2000). Working women identify influences and obstacles to breast health practices. *Oncology Nurse Forum, 27*(5), 810–835.
- Tang, T. S., Solomon, L. J., Yeh, C. J., & Worden, J. K. (1999). The role of cultural variables in breast self-examination and cervical cancer screening behavior in young Asian women living in the United States. *Journal of Behavioral Medicine, 22*(5), 419–436.