

Factors Affecting Jordanian Women's Surgical Treatment Decisions for Early-Stage Breast Cancer

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ABSTRACT

Objective: This study aimed to assess factors influencing surgical treatment decisions for early-stage breast cancer among Jordanian women. **Methods:** A descriptive correlational survey design was utilized to meet the study objective. A total of 180 Jordanian women diagnosed with unilateral early-stage breast cancer (Stages I–II) were recruited from the radiotherapy departments and outpatient surgical and breast cancer clinics at King Hussein Cancer Center (KHCC). Participants completed a structured questionnaire consisting of the Arabic version of the Depression Anxiety Stress Scale, Breast Surgery Beliefs and Expectations Scale, and the Arabic version of the Control Preference Scale. **Results:** The majority of the participants underwent mastectomy as a definitive surgical treatment (i.e. 67%). Only stage at diagnosis and having a second opinion about surgical treatment options were significantly

associated with the type of surgical procedure women opted for. The overwhelming majority of the participants in both groups cited the items of “Minimize the chance of breast cancer coming back” and “Minimize the chance of dying of breast cancer” as very important in their decisions for surgical treatment of unilateral early-stage breast cancer. Women who cited the item “remove breast for peace of mind” as important/very important were more likely to opt for mastectomy than women who cited the item as not important. **Conclusions:** Mastectomy is the preferred surgical treatment option for the majority of Jordanian women diagnosed with unilateral early-stage breast cancer at KHCC.

Key words: Breast, cancer, decision-making, Jordan

Introduction

Breast cancer is the most common cancer among Jordanian females and the third cause of cancer-related mortality among both males and females in the country.^[1] Numerous clinical trials have proved the equivalence in efficiency and long-term survival between breast-conserving surgery followed by breast irradiation and modified radical mastectomy as primary surgical

treatment of early-stage breast cancer among women with no absolute contraindications to breast-conserving surgery.^[2-4] Further, recent studies have reported that breast-conserving surgery is even preferable to modified radical mastectomy and is associated with better health outcomes such as psychological health and health-related quality of life.^[4,5]

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It has been agreed on for decades that the decision-making process for surgical treatment of early-stage breast cancer is best suited for the shared decision-making approach. In shared decision-making, both the patient and the surgeon jointly agree on the final treatment decision that is based on individual woman's values and preferences after a deliberative discussion of each surgical treatment alternative, its pros, and cons.^[6]

Studies of factors influencing women's decisions for surgical treatment of early-stage breast cancer reported that women's, clinical, and surgeon's factors are associated with women's choice of surgical treatment options. Women's factors included age younger than 40 years, ethnicity, socioeconomic status, distance to treatment facilities, especially radiation therapy centers, and women's personal values and beliefs about surgical treatment options (e.g. mastectomy for peace of mind, body image). Clinical factors included stage of the breast cancer and size of the tumor. Surgeon's factors included female gender and patient load.^[7-10]

In Jordan, the majority of Jordanian women diagnosed with early-stage breast cancer opt for mastectomy as the primary surgical treatment. However, no prior studies have investigated the current trend of the high rate of mastectomies among Jordanian women and what informs their choice of surgical treatment for early-stage breast cancer. Understanding factors influencing Jordanian women's surgical choices for early-stage breast cancer may inform the development of culturally sensitive interventions to promote communication about treatment options and women's participation in the treatment decision-making process. Further, if factors such as distance of women's residence from radiation treatment facilities^[7] are found to be associated with their surgical treatment decisions, this information may inform health-care spending and service planning at the national level. Thus, the primary purpose of this study was to assess factors influencing surgical treatment decisions for early-stage breast cancer among Jordanian women. Specific aims of the study were to: (1) examine differences in women's choice of surgical treatment options by their demographic and clinical characteristics and (2) examine differences in women's choice of surgical treatment options by their beliefs and expectations of surgical treatment options for early-stage breast cancer. A secondary purpose of the study was to assess the impact of the actual surgical treatment decisions on women's psychological status.

Conceptual framework

Ottawa Decision Support Framework^[11] guided the design and conduction of this study. Ottawa Decision Support Framework has been developed based on theories

from different disciplines (e.g., general psychology, clinical psychology, decision analysis.etc.) to guide decision-making in both clinical and social contexts. The framework proposes that high-quality decisions should be based both on values and/or personal preferences and scientific evidence. The framework asserts that decision needs (e.g., information, knowledge, and expectations, values, support, and resources...etc.) influence the achievement of informed and value-based decisions and both clinical (e.g., appropriate use of services) and health outcomes (e.g., improved satisfaction, decreased decisional regret, improved health-related quality of life). Further, the framework asserts that interventions to meet the decision needs such as decision support tools, counseling, or coaching can improve decision quality and positively affect clinical and health outcomes.

Methods

Research design

A descriptive correlational survey design was used to meet the purpose and specific aims of the study.

Subjects and setting

Convenience sampling technique was used to recruit the study participants. Jordanian women who had a confirmed first-time diagnosis of unilateral early-stage breast cancer (i.e. Stages I–II) within 5 years prior to data collection, were candidates for either breast-conserving surgery or mastectomy at time of diagnosis, and underwent either breast-conserving surgery or mastectomy as a definitive surgical treatment were invited to the study. *A priori* power analysis revealed that for an independent samples *t*-test and based on a moderate effect size of 0.5, power estimate of 80%, and alpha of 0.05, a total of 128 women would need to be approached. To account for potential nonresponse, 30% of the calculated sample size more women were invited for participation in the study for a total of 180 women.

Women who met the aforementioned eligibility criteria were recruited from the radiotherapy departments and outpatient surgical and breast cancer clinics at King Hussein Cancer Center (KHCC). KHCC was selected at the setting for this study because it is the only specialized cancer center in Jordan and the only clinical setting in the country that offers women diagnosed with unilateral early-stage breast cancer surgical treatment options. KHCC provides treatment for about 60% of all cancer cases in Jordan. Approximately 700 new breast cancer cases among women per year (58/month) are treated at KHCC. About 60% of those are diagnosed with early-stage breast cancer (i.e. 420 women).^[12] Women diagnosed with early-stage breast cancer are offered surgical treatment

options during surgical consultations at KHCC. The pros and cons of each treatment option are discussed in the consultation and women are given time to ask questions. The surgeon gives women time to search about treatment options, get a second medical opinion if desired, and make a final treatment decision.

Measures

A study packet that included a researcher-designed demographic datasheet, the Arabic version of the Depression Anxiety Stress Scale (DASS), Breast Surgery Beliefs and Expectations Scale, and the Arabic version of the Control Preference Scale (CPS) was used for collecting data from eligible women.

DASS-21 is a 21-item self-report questionnaire that is widely used to measure and distinguish between depression, anxiety, and stress both in clinical and nonclinical samples.^[13,14] DASS demonstrated good psychometric properties in numerous studies and in different languages.^[14-17] The Arabic version DASS has also demonstrated good psychometric properties and is further used in both clinical and nonclinical samples.^[18-20] The scale showed satisfactory internal consistency reliability in the current study with a Cronbach's alpha of 0.944.

Breast Surgery Beliefs and Expectations Scale was developed to assess factors influencing surgical treatment decisions among English-speaking American women diagnosed with early-stage breast cancer.^[21] The scale was developed based on relevant literature of early-stage breast cancer. The scale has nine items that ask the participants to indicate on a scale ranging from 1 (not at all important) to 4 (very important) the importance of each of the 9 items in their decisions for surgical treatment of unilateral early-stage breast cancer. The scale showed satisfactory content and construct validity in the original study.

The Breast Surgery Beliefs and Expectations Scale was translated into Arabic by the principal investigator who is a native speaker of Arabic and fluent in English using the translation-back-translation method. The Arabic version of the scale was reviewed by a panel of breast cancer experts comprised of nurse researchers, breast cancer nurses, and breast surgeons to assure the conceptual equivalency of translation into Arabic, item appropriateness, item relevance, and comprehensibility of the scale. The scale showed satisfactory internal consistency reliability in the current study with a Cronbach's alpha of 0.67.

To elicit women's perceptions about the degree of control they had in treatment decision-making, the Arabic version of the CPS^[22] was used. The original English scale has shown good psychometric properties in numerous studies of patients' preferences for participation in medical decision-making.^[23] The Arabic version of the scale has been

tested and used in a previous study of Jordanian women's preferences for participation in breast cancer treatment decision-making and found to have good psychometric properties.^[24] The scale was modified to assess women's perceptions of who made the final surgical treatment decision.

Demographic data collected from participating women included age, marital status, level of education, area of residence, employment status, income level, insurance status, and personal and family history of breast cancer. Finally, an open-ended question was used at the end of the study questionnaire to give women the opportunity to comment about the reason for their surgical choice and provide reasons other than those included in the study measures if any.

Procedures

Institutional Review Board approval at KHCC was granted before commencing data collection. Women who presented for follow-up at the breast cancer clinic were approached by a trained data collector (i.e. a breast cancer nurse) who explained details of the study, screened women for eligibility, and invited those who are potentially eligible to participate. The data collector/breast cancer nurse reviewed each woman's medical record to confirm her eligibility for the study and to collect clinical data (e.g. stage of breast cancer, type of surgical treatment, date of diagnosis...etc.) after having her permission. Women who were confirmed to be eligible and agreed to participate in the study were asked to sign a written consent form. Consented women were given the study packet and instructed to complete it at their convenience and return it back to the data collector during their next appointment with their health provider at KHCC. Data collection was completed between January 2019 and January 2020.

Statistical analysis

Data analysis was performed using IBM SPSS® Statistics (version 24). Descriptive statistics including means, standard deviations, and frequency percentages were used to describe the demographic and clinical characteristics of the total sample and both subgroups (i.e. according to type of definitive surgical treatment used), responses to the Breast Surgery Beliefs and Expectations Scale, and women's perceptions of who made the surgical treatment decision as appropriate. Differences in women's surgical treatment decisions by their demographic and clinical characteristics were analyzed using independent samples *t*-test and Chi-square test as appropriate. Total scores and subscales scores of the DASS for each group were compared using one-way analysis of variance. An alpha of 0.05 was used to determine statistical significance.

Results

Sample description

A total of 180 Jordanian women who met the inclusion criteria of the study completed the study questionnaire. However, 16 questionnaires were excluded from the analysis because of large missing data leaving a total of 164 responses for analysis. Study participants had a mean age of 48.18 years (range 23–71), more than a third of them (44.2%) had a bachelor's or a master's degree, and the majority were married (76.7%), had a public insurance (73.3%), unemployed (56.0%), and were residents of the Capital Amman (75.2%) [Table 1].

The study participants were primarily diagnosed with Stage I breast cancer (50.7%) and underwent mastectomy as a definitive surgical treatment (67.1%). Time since diagnosis ranged from one to 20 months prior to data collection. Almost 35% perceived that they had shared the decision-making process with their surgeons, while almost 41% felt that they had a passive role in the surgical decision-making process Table 2.

Differences in women's choice of surgical treatment options by their demographic and clinical characteristics

As illustrated in Table 3, results of bivariate statistical analysis have shown that only stage at diagnosis and having a second opinion about surgical treatment options were significantly associated with the type of surgical procedure women opted for. Women who were diagnosed with Stage I breast cancer were more likely to opt for breast-conserving surgery compared to women who were diagnosed with Stage II breast cancer ($\chi^2 = 18.93$, $df = 2$, $P < 0.05$). Women who cited having had a second opinion (i.e. consulting another breast cancer specialist/surgeon) about surgical treatment options were more likely to opt for breast-conserving surgery compared to women who did not have a second opinion about surgical treatment options ($\chi^2 = 5.47$, $df = 1$, $P < 0.05$).

Differences in women's choice of surgical treatment options by their beliefs and expectations of surgical treatment options

The majority of the participants cited the items of "Minimize the chance of breast cancer coming back" (92.0%) and "Minimize the chance of dying of breast cancer" (83.3%) as very important in their decisions for surgical treatment of unilateral early-stage breast cancer. "Keep my breast" was the item cited by the majority of the participants as the least important factor to consider in making their decisions for surgical treatment of early-stage breast cancer (37.6%) [Table 4]. No reasons for the surgical

Table 1: Demographic characteristics of the participant (n = 164)

Characteristics	n (%) [†]
Age, years (mean ± SD)	48.18 ± 9.13
Type of insurance	
Public	115 (73.3)
Military	3 (1.9)
Private	23 (14.7)
Uninsured	15 (9.6)
Education level	
Lower secondary education	14 (8.6)
Upper secondary education	42 (25.8)
Postsecondary education	31 (21.5)
Bachelor or equivalent	63 (38.7)
Masters or equivalent	9 (5.5)
Employment status	
Employed	54 (34.0)
Not employed	89 (56.0)
Retired	15 (9.4)
Marital status	
Single	25 (15.3)
Married	125 (76.7)
Divorced	4 (2.5)
Widow	9 (5.5)
Family history of breast cancer	
Yes	65 (39.9)
No	97 (59.5)
Patients have children	
Yes	131 (80.4)
No	31 (19.0)

[†]Percentages are based on valid cases. SD: Standard deviation

Table 2: Clinical characteristics of the participants (n = 164)

Characteristics	n (%) [†]
Stage at diagnosis	
Stage I	76 (50.7)
Stage II	73 (48.7)
Surgery type	
Lumpectomy	54 (32.9)
Mastectomy	110 (67.1)
Second opinion regarding surgical treatment options	
Yes	82 (50.0)
No	82 (50.0)
Screening mammography before diagnosis	
Yes	104 (64.2)
No	58 (35.8)
Perceived role in surgical decision-making process	
Active	40 (24.4)
Shared	57 (34.8)
Passive	67 (40.9)

[†]Percentages are based on valid cases

choice other than those included in the study measures were provided by the participants in the open-ended question of the questionnaire.

Women who cited the item "remove breast for peace of mind" as important/very important were

Table 3: Bivariate analysis of women's choice of surgical treatment options by their demographic and clinical characteristics

Characteristics	Breast-conserving surgery (n=54), n (%)	Mastectomy (n=110), n (%)	P
Age, years			
20-39	5 (9.3)	15 (13.6)	0.537
40-59	39 (72.2)	69 (62.7)	
60 and above	10 (18.5)	26 (23.6)	
Education level			
Lower secondary education	5 (9.4)	9 (8.2)	0.891
Upper secondary education	12 (22.6)	30 (27.3)	
Postsecondary education	13 (24.5)	22 (27.3)	
Bachelor or equivalent	21 (39.6)	42 (38.2)	
Masters or equivalent	2 (3.8)	7 (6.4)	
Employment status			
Employed	18 (33.3)	36 (34.3)	0.958
Not employed	30 (55.6)	59 (56.2)	
Retired	6 (11.1)	9 (8.6)	
Marital status			
Single	9 (17.0)	16 (14.5)	0.212
Married	37 (69.8)	88 (80.0)	
Divorced	3 (5.7)	1 (0.9)	
Widow	4 (7.5)	5 (4.5)	
Stage at diagnosis			
Stage I	34 (63.0)	48 (43.6)	0.000**
Stage II	20 (37.0)	62 (56.4)	
Second opinion regarding surgical treatment options			
Yes	32 (65.3)	33 (38.4)	0.030*
No	17 (34.7)	53 (61.6)	
Screening mammography before diagnosis			
Yes	39 (73.6)	65 (59.6)	0.115
No	14 (26.4)	44 (40.4)	

*P<0.05, **P<0.001

Table 4: Frequency distribution of factors affecting women's surgical treatment choice

Factor	Not at All important, n (%)	Somewhat important, n (%)	Important, n (%)	Very important, n (%)
Keep my breast	59 (37.6)	34 (21.7)	15 (9.6)	49 (31.2)
Minimize the chance of breast cancer coming back	2 (1.2)	7 (4.3)	4 (2.5)	150 (92.0)
Avoid radiation	36 (22.8)	42 (26.6)	30 (19.0)	50 (31.6)
Minimize the length of treatment	31 (19.3)	27 (16.8)	34 (21.1)	68 (42.9)
Remove breast for peace of mind	13 (8.0)	26 (16.0)	32 (19.8)	91 (56.2)
Avoid the need for future mammograms/breast screening	44 (27.3)	35 (21.7)	30 (18.6)	52 (32.3)
Do as little surgery as possible	40 (25.8)	37 (23.9)	26 (16.8)	52 (33.5)
Minimize the chance of dying of breast cancer	9 (5.6)	10 (6.2)	8 (4.9)	135 (83.3)
Have the option to improve my breasts through reconstruction	35 (21.6)	19 (11.7)	21 (13.0)	87 (53.7)

more likely to opt for mastectomy than women who cited the item as not important ($\chi^2 = 29.52$, $df = 3$, $P < 0.05$). In contrast, women who cited the item "keep my breast" as important/very important were more likely to opt for breast-conserving surgery than women who cited the item as not important ($\chi^2 = 41.84$, $df = 3$, $P < 0.05$). There were no significant associations between women's choice of surgical treatment options and the other items in the Breast Surgery Beliefs and Expectations Scale.

Impact of the actual surgical treatment decisions on women's psychological status

Overall, more than 50% of involved women had varying degrees of depression, anxiety, or stress. Anxiety was the most commonly reported symptom by participating women with almost 40% of them reporting severe or very severe anxiety in the week that preceded the data collection. No statistically significant differences were found between women in the mastectomy group and women in the breast-conserving surgery group on the three DASS

subscales [Table 5]. However, further bivariate statistical analysis revealed that stage at diagnosis was the only factor among all demographic and clinical factors that had a significant association with the level of anxiety women reported only. Women who were diagnosed with Stage II breast cancer were more likely to report a moderate to severe level of anxiety compared to those diagnosed with Stage I breast cancer ($\chi^2 = 6.78$, $df = 2$, $P < 0.05$).

Discussion

The purpose of this descriptive correlational study was to assess factors influencing surgical treatment decisions for early-stage breast cancer among Jordanian women. Results of this study revealed that the majority of Jordanian women diagnosed of early-stage breast cancer opt for mastectomy as a primary surgical treatment (i.e. 67%). The rate of mastectomy among Jordanian women diagnosed with early-stage breast cancer who were eligible for breast-conserving surgery at the time of diagnosis is thus higher than mastectomy rate among Western women.^[25,26] However, mastectomy rate among Jordanian women is comparable to that among other Asian women and women in low or middle-income countries.^[27,28] This similarity could be explained by some shared cultural and health-care systems factors between Jordan and those Asian countries. For instance, a mastectomy rate of 56.4% was reported among Chinese women^[27] which is close to the rate reported in the current study.

Only stage at diagnosis and having had a second opinion regarding surgical treatment options among all demographic and clinical factors examined in this study had significant associations with women's surgical treatment

choice. Women diagnosed with Stage I breast cancer and those who had a second opinion about surgical treatment options were more likely to opt for breast-conserving surgery. This finding is consistent with other regional and international studies which also showed that the earlier the stage of breast cancer at a diagnosis, the more likely women would choose breast-conserving surgery as a primary surgical treatment.^[29-31] The most plausible explanation for this finding could be that stage at diagnosis had influenced women's perceptions about the severity of the diagnosis and thus its potential consequences on their health and survival which might have led more women with Stage II breast cancer to opt for mastectomy to reduce the potential risks of the diagnosis on their health and survival. Having a second opinion on surgical treatment options might have led women to acquire more information about risks and benefits of each treatment option and thus to make a decision that is more informed compared to women who did not have a second opinion.

"Minimize the chance of breast cancer coming back" and "Minimize the chance of dying of breast cancer" were the top two cited beliefs as most influential to women's choice of mastectomy. This result is consistent with previous studies as these two individual beliefs were frequently cited by patients as influential for choosing mastectomy over breast-conserving surgery.^[29,32] Prior research has shown that body image and femininity issues are the most influential individual beliefs to women's choice of breast-conserving surgery.^[29,32] In this study, however, women in the breast-conserving surgery group cited "Minimize the chance of breast cancer coming back" and "Minimize the chance of dying of breast cancer" as the most influential for

Table 5: Frequency distribution of the severity levels of depression, anxiety, and stress

Symptom and level	Mastectomy (n=110), n (%)	Breast-conserving surgery (n=54), n (%)	F	P
Depression				
Normal	48 (43.6)	26 (48.1)	1.13	0.89
Mild	12 (10.9)	5 (9.3)		
Moderate	17 (15.5)	9 (16.7)		
Severe	11 (10.0)	3 (5.6)		
Extremely severe	22 (20.0)	11 (20.4)		
Anxiety				
Normal	35 (31.8)	19 (35.2)	0.68	0.95
Mild	17 (15.5)	10 (18.5)		
Moderate	13 (11.8)	5 (9.3)		
Severe	11 (10.0)	5 (9.3)		
Extremely severe	34 (30.9)	15 (27.8)		
Stress				
Normal	54 (49.1)	28 (51.9)	3.41	0.49
Mild	12 (10.9)	6 (11.1)		
Moderate	14 (12.7)	7 (13.0)		
Severe	16 (14.5)	3 (5.6)		
Extremely severe	14 (12.7)	10 (18.5)		

choosing breast-conserving surgery over mastectomy. This finding could be explained by the fact that women in the breast-conserving group were more likely to have a second opinion about surgical treatment options and thus they might have had a better understanding of the equivalent long-term survival and local reoccurrence of the two surgical treatment options. This finding raises a question about whether women who opted for mastectomy were adequately informed about surgical treatment options before making their decisions.

“Remove breast for peace of mind” was more important for women choosing mastectomy over breast-conserving surgery which is consistent with previous studies.^[29,33] This finding could be a reflection of a belief among some women in this study that mastectomy is a safer treatment option in terms of reoccurrence and long-term survival. This stresses the importance of information provision to newly diagnosed breast cancer patients and giving them sufficient time to comprehend this information to be better able to make informed surgical treatment decisions. On the other hand, there might be other factors not included in our study questionnaire that have influenced women's decisions. For instance, we have not collected information on histopathological characteristics of the tumors such as involvement of lymph nodes, tumor grade, tumor size, tumor focality, and tumor centricity, surgeon's recommendation, or on the influence of the husband on women's decisions. Hence, a future qualitative study would be needed to gain an understanding of factors that may influence women's surgical treatment decisions.

Although the majority of participating women reported varying degrees of depression, anxiety, or stress, no significant differences were found between women in the breast-conserving group and those in the mastectomy group in the levels of the three psychological symptoms. This finding is concordant with results of the systematic review and meta-analysis conducted by Zhang *et al.*^[34] which showed that type of surgery did not have a significant effect on depressive symptoms among women who underwent surgical treatment for early-stage breast cancer. However, an alarming finding of this study is the high prevalence of moderate-to-severe levels of depression, anxiety, and stress among the participants in both groups. This finding may reflect the possibility that these women, especially those diagnosed with Stage II breast cancer, are occupied with fear of cancer reoccurrence regardless of the type of surgical treatment they had and thus the presence of unmet psychological support care needs among them.

Conclusions

This study has shown that when offered surgical treatment options, the majority of Jordanian women

diagnosed with unilateral early-stage breast cancer at KHCC opt for mastectomy. In this study, women who were diagnosed with Stage I breast cancer and had a second opinion regarding surgical treatment options were more likely to opt for breast-conserving surgery. This study further revealed the existence of varying levels of psychological distress among women in both groups with anxiety as the most prevalent symptom, especially among women diagnosed with Stage II breast cancer.

Limitations

This study has several limitations that should be addressed in future research. First, this study utilized a convenience sampling and was limited to one clinical setting which would limit the representativeness of the study sample and thus the generalizability of its findings. Thus, future research should aim to recruit a more diverse sample from different clinical settings in the country. Second, the study was a retrospective study and relied on self-report data with a possibility of a recall bias. Third, the majority of the participants were highly educated and residing in the capital of the country, Amman. Thus, the results of this study might not be generalizable to Jordanian women who are less educated or residing in other regions of the country (i.e., southern and northern). Finally, information on histopathological characteristics of the tumors (e.g., involvement of lymph nodes, tumor grade, tumor size, tumor focality, and tumor centricity), surgeon's recommendation, and husband or significant others influence on women's decisions were not collected in this study.

Clinical implications

Tailored information provision to newly diagnosed breast cancer patients taking is paramount to be better able to make informed surgical treatment decisions. Thus, health-care providers have a responsibility to individually assess women's knowledge about breast cancer and surgical treatment options during the decision-making process to assure that they have the most-up-to date evidence-based information about risks and benefits of those options and thus are better able to make informed surgical decisions. Further, given the time constraints that may hinder Jordanian physicians ability to sufficiently involve patients in treatment decision-making,^[35] there is a need for future interventional research to develop, implement, and evaluate a decision aid that is specifically designed to enhance the capacity of Jordanian women to make high-quality surgical treatment decisions. Further, results of this study should inform the development and delivery of clinical psychological supportive care services to Jordanian breast cancer survivors across all disease trajectories to help them

cope with fear of cancer reoccurrence and reduce the possibility of developing a dysfunctional fear of recurrence that would negatively impact their quality of life.

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Conflicts of interest

The corresponding author, Dr. Rana F. Obeidat is an editorial board member of *Asia-Pacific Journal of Oncology Nursing*. The article was subject to the journal's standard procedures, with peer review handled independently of Dr. Obeidat and their research groups.

References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2018;68:394-424.
2. Curigliano G, Burstein HJ, Winer PE, Gnant M, Dubsy P, Loibl S, *et al.* De-escalating and escalating treatments for early-stage breast cancer: The St. Gallen international expert consensus conference on the primary therapy of early breast cancer. *Ann Oncol* 2017;28:1700-12.
3. Jason CY, Yan W, Christos PJ, Nori D, Ravi A. Equivalent survival with mastectomy or breast-conserving surgery plus radiation in young women aged <40 years with early-stage breast cancer: A national registry-based stage-by-stage comparison. *Clin Breast Cancer* 2015;15:390-7.
4. van Maaren MC, de Munck L, de Bock GH, Jobsen JJ, van Dalen T, Linn SC, *et al.* 10 year survival after breast-conserving surgery plus radiotherapy compared with mastectomy in early breast cancer in the Netherlands: A population-based study. *Lancet Oncol* 2016;17:1158-70.
5. Hartmann-Johnsen OJ, Kåresen R, Schlichting E, Nygård JF. Survival is better after breast conserving therapy than mastectomy for early stage breast cancer: A registry-based follow-up study of Norwegian women primary operated between 1998 and 2008. *Ann Surg Oncol* 2015;22:3836-45.
6. Zdenkowski N, Butow P, Tesson S, Boyle F. A systematic review of decision aids for patients making a decision about treatment for early breast cancer. *Breast* 2016;26:31-45.
7. Gu J, Groot G, Holtlander L, Engler-Stringer R. Review of factors influencing women's choice of mastectomy versus breast conserving therapy in early stage breast cancer: A systematic review. *Clin Breast Cancer* 2018;18:e539-54.
8. Gu J, Groot G, Holtlander L, Engler-Stringer R. Understanding women's choice of mastectomy versus breast conserving therapy in early-stage breast cancer. *Clin Med Insights Oncol* 2017;11:1-7.
9. Hamelinck VC, Bastiaannet E, Pieterse AH, Merkus JW, Jannink I, den Hoed ID, *et al.* A prospective comparison of younger and older patients' preferences for breast conserving surgery versus mastectomy in early breast cancer. *J Geriatr Oncol* 2018;9:170-3.
10. Luo T, Spolverato G, Johnston F, Haider AH, Pawlik TM. Factors that determine cancer treatment choice among minority groups. *J Oncol Pract* 2015;11:259-61.
11. Légaré F, O'Connor AC, Graham I, Saucier D, Côté L, Cauchon M, *et al.* Supporting patients facing difficult health care decisions: use of the Ottawa Decision Support Framework. *Can Fam Physician* 2006;52:476-7.
12. Abdel-Razeq H, Mansour A, Jaddan D. Breast cancer care in Jordan. *JCO Glob Oncol* 2020;6:260-8.
13. Page AC, Hooke GR, Morrison DL. Psychometric properties of the Depression Anxiety Stress Scales (DASS) in depressed clinical samples. *Br J Clin Psychol* 2007;46:283-97.
14. Brown TA, Chorpita BF, Korotitsch W, Barlow DH. Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behav Res Ther* 1997;35:79-89.
15. Henry JD, Crawford JR. The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *Br J Clin Psychol* 2005;44:227-39.
16. Caplan B, Bogner J, Brenner L, Randall D, Thomas M, Whiting D, *et al.* Depression Anxiety Stress Scales (DASS-21): Factor structure in traumatic brain injury rehabilitation. *J Head Trauma Rehabil* 2017;32:134-44.
17. Bottesi G, Ghisi M, Altoè G, Conforti E, Melli G, Sica C. The Italian version of the Depression Anxiety Stress Scales-21: Factor structure and psychometric properties on community and clinical samples. *Compr Psychiatry* 2015;60:170-81.
18. Ali AM, Ahmed A, Sharaf A, Kawakami N, Abdeldayem SM, Green J. The Arabic version of the depression anxiety stress scale-21: Cumulative scaling and discriminant-validation testing. *Asian J Psychiatr* 2017;30:56-8.
19. Moussa MT, Lovibond P, Laube R, Megahead HA. Psychometric properties of an Arabic version of the depression anxiety stress scales (DASS). *Res Soc Work Pract* 2017;27:375-86.
20. Bener A, Alsulaiman R, Doodson L, El Ayoubi H. Comparison of reliability and validity of the breast cancer depression anxiety stress scales (DASS-21) with the beck depression inventory-(BDI-II) and hospital anxiety and depression scale (HADS). *Int J Behav Res Psychol* 2016;4:197-203.
21. Yackzan SG. Factors influencing preference for surgical choice among women with early stage breast cancer. [PhD thesis]. Kentucky, USA: University of Kentucky;2017.
22. Degner LF, Kristjanson LJ, Bowman D, Sloan JA, Carriere K, O'Neil J, *et al.* Information needs and decisional preferences in women with breast cancer. *JAMA* 1997;277:1485-92.
23. Degner LF, Sloan JA, Venkatesh P. The control preferences scale. *Can J Nurs Res Arch* 1997;29:21-43.
24. Obeidat R. Decision-making preferences of Jordanian women diagnosed with breast cancer. *Support Care Cancer* 2015;23:2281-5.
25. Carlson GW. The changing surgical treatment of breast cancer in the United States: The tipping point. *Breast J* 2020;26:11-6.
26. Fancellu A, Sanna V, Cottu P, Feo CF, Scanu AM, Farina G, *et al.* Mastectomy patterns, but not rates, are changing in the treatment of early breast cancer. Experience of a single European institution on 2315 consecutive patients. *Breast* 2018;39:1-7.
27. Al-Gaithy ZK, Yaghmoor BE, Koumu MI, Alshehri KA, Saqah AA, Alshehri HZ. Trends of mastectomy and breast-conserving surgery and related factors in female breast cancer patients treated at King Abdulaziz University Hospital, Jeddah, Saudi Arabia, 2009-2017: A retrospective cohort study. *Ann Med Surg (Lond)* 2019;41:47-52.
28. Chen R, You S, Yin Z, Zhu Q, Jiang C, Li S, *et al.* Non-doctoral factors influencing the surgical choice of Chinese patients

- with breast cancer who were eligible for breast-conserving surgery. *World J Surg Oncol* 2019;17:189.
29. Gu J, Groot G, Boden C, Busch A, Holtslander L, Lim H. Review of factors influencing women's choice of mastectomy versus breast conserving therapy in early stage breast cancer: A systematic review. *Clin Breast Cancer* 2018;18:e539-54.
 30. Suggs PD, Holliday TL, Thompson SN, Richmond BK. Factors affecting choice of treatment for early-stage breast cancer in West Virginia: A 10-year experience from a rural tertiary care center. *Am Surg* 2017;83:709-16.
 31. McCrate F, Dicks E, Powell E, Chafe J, Roome R, Simmonds C, *et al.* Surgical treatment choices for breast cancer in Newfoundland and Labrador: A retrospective cohort study. *Can J Surg* 2018;61:377-84.
 32. Dicks E, Roome R, Chafe J, Powell E, McCrate F, Simmonds C, *et al.* Factors influencing surgical treatment decisions for breast cancer: A qualitative exploration of surgeon and patient perspectives. *Curr Oncol* 2019;26:e216-25.
 33. Lee W, Tan V, Choo H, Ong J, Krishnapriya R, Khong S, *et al.* Factors influencing patient decision-making between simple mastectomy and surgical alternatives. *BJS Open* 2019;3:31-7.
 34. Zhang C, Hu G, Biskup E, Qiu X, Zhang H, Zhang H. Depression induced by total mastectomy, breast conserving surgery and breast reconstruction: A systematic review and meta-analysis. *World J Surg* 2018;42:2076-85.
 35. Obeidat R, Lally RM. Jordanian physicians' perceived barriers and facilitators to patient participation in treatment decision-making: An exploratory study. *Indian J Cancer* 2018;55:377-81.