ORIGINAL ARTICLE

The Effects of Mastectomy and Post-Mastectomy Reconstructive Surgeries on Depression, Self-esteem, and Self-efficacy Belief Levels in Patients with Breast Cancer

Zehra Kanmaz[1], Osman Tolga Aricak[2]

[1]Mersin City Hospital, Mersin, Turkey, [2]Hasan Kalyoncu University, Department of Psychology, Gaziantep, Turkey

ABSTRACT

Objective: The aim of this present study is to examine the effects of mastectomy and post-mastectomy reconstructive operations on depression, self-esteem, and self-efficacy belief levels in patients with breast cancer compared with healthy controls.

Methods: A cross-sectional and correlational research design was implemented. Our study sample were composed of 240 women. Participants were 75 mastectomy patients, and 32 post-mastectomy reconstructive surgery patients, and 133 healthy women. In data collection, Personal Information Form, General Self-efficacy Scale, Coopersmith Self-esteem Inventory and Beck Depression Inventory have been used. Due to non-normal distribution of the variables; Mann-Whitney U, Kruskal-Wallis H and Spearman Rho correlation techniques were used to analyze the data.

Results: We found that mastectomy patients' depression scores were higher than patients who had post-mastectomy reconstructive operation and control group. In addition; compared to patients with post-mastectomy reconstructive operations and control group, mastectomy patients had lower levels of self-esteem and self-efficacy beliefs.

Conclusions: It was then concluded that in terms of depression, self-esteem and self-efficacy levels, the best treatment might have been a combination of chemotherapy, hormonal therapy, and reconstructive surgery.

Keywords: Cancer, depression, mastectomy, reconstructive surgery, self-esteem, self-efficacy

INTRODUCTION

There has been a rapid global and national increase in the prevalence of breast cancer which is one of the most complex diseases of modern age. The upward trend in its prevalence has turned this disease into a serious public-health problem (1-3). According to statistical cancer data released by the World Health Organization (WHO) 18.1 million of new cancer cases emerge each year globe wide (4). Breast cancer is the most common cancer type in women and is estimated to affect more than 10% of women (5).

In most societies female breast symbolizes sexuality, aesthetic image, and maternal feelings. Such sentimentality attributed to this body part is predictive of associated psychological concerns and intensity of these concerns. Losing a breast, when associated with catastrophic symbols, may lead to a great trauma in any patient who cannot stand even the idea of losing her breast. Surgical interventions threaten integrity of the patient, thereby weakening physical and mental self-confidence of the

patient. The patient is overwhelmed with a constant worry on the change in her physical image, loss of authority on her body, decrease in sexual attraction and function, disconnection with the surrounding circle and friends (6,7).

Although challenged with a great number of adversities, patients still have to continue medical treatments too. Mastectomy in breast surgery leads to underlying worries on reconstruction, fertility, likelihood of familial predisposition and specific concerns associated with the sexual symbolization of breast. This severe physical loss adversely affects body image and self-esteem of a woman (8).

In recent years there has been a rise in the number of women having received post-mastectomy reconstructive prostheses. An individual may resort to breast reconstruction to eliminate the repercussions of breast loss and distorted image of her body. This intervention is remarkably important in enhancing women's psychological and social functionality (9,10).

In relevant literature there is an abundance of studies analyzing the effects of mastectomy and post-mastectomy reconstructive operation on patients' self-esteem (11-14), yet there is a limited focus on its direct effect on self-efficacy belief. There are greater numbers of studies that examined the relationship of self-efficacy defined as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (15) in tandem with some other psychological factors.

In a study conducted by Foster et. al on 182 cancer patients aged between 23–79; the connection of self-efficacy belief with socio-demographic features of the patient, characteristics of the disease, positive thoughts on being healthy, depressive thoughts, disease perception and available social support have been examined (16). The research concluded that self-efficacy belief was not correlated with patients' age, marital status, professional status, cancer type, duration after the treatment, and a comorbid disease. It was identified that high self-efficacy belief of patients was correlated with positive thoughts on being healthy. Low self-efficacy belief led to a surge in intensified worries on the disease. Based on the research outcome it was argued that low self-efficacy belief was linked with pessimism stemming from depression. Besides it became clear that patients' perception of the disease as a threat was associated with a low level of self-efficacy belief (16).

An individual's personal aptitude in stress management, self-efficacy and adaptation talents help decrease worries. In cancer patients it was monitored that self-efficacy belief was effective in symptom management and promoting healthy behaviors. A study comprising of 152 patients and 152 care-givers manifested that patients with high self-efficacy level less frequently complained to their care-givers about their pain and demonstrated no symptoms of depression and anxiety. In the same vein, care-givers with high self-efficacy belief coped with the symptoms of their patient more comfortably (17).

In light of relevant literature it is hypothesized that self-efficacy beliefs played a positive and critical role in crisis management and attitudes during the treatment of mastectomy and post-mastectomy patients having undergone a reconstructive operation. The aim of this present study is to examine the effects of surgery method and applied therapy combinations on patients' depression, self-esteem, and self-efficacy levels.

METHODS

Study Participants and Procedure Participants

Research sample consisted of 240 women. Patient group consisted of 75 mastectomy patients (Mage=52.11±9.26) and 32 patients having undergone post-mastectomy breast reconstructive operation (Mage=44.03±5.63) who visited, after diagnosed with breast-cancer, Medical Oncology Clinic and Breast Policlinic of the City Hospital between January and July 2018. Control group consisted of 133 healthy women (Mage=37.20±8.50). People who were diagnosed with any psychiatric disorder among patients and healthy group were excluded. Data on the demographic features of participants is as seen in Table 1.

Table 1: Sociodemographic features of the participants

	Mastectomy patients n (%)	Reconstructive surgery patientsn (%)	Healthy group n (%)	Total n (%)
Marital status				
Married	59 (78.7%)	28 (87.5%)	93 (69.9%)	180 (75%)
Single	3 (4%)	1 (3.1%)	33 (24.8%)	37 (15.4%)
Divorced/Widow	13 (17.3%)	3 (9.4%)	7 (5.3%)	23 (9.6%)
Education				
Only literate	9 (12%)	0 (0%)	0 (0%)	9 (3.8%)
Elementary and Middle school	48 (64%)	12 (37.5%)	14 (10.5%)	74 (30.8%)
High school	16 (21.3%)	13(40.6%)	23 (17.3%)	52 (21.7%)
University	2 (2.7%)	7 (21.9%)	96 (72.2%)	105 (43.8%)
SES				
Low	33 (44%)	5 (15.6%)	16 (12%)	54 (22.5%)
Middle	42 (56%)	26 (81.3%)	105 (78.9%)	173 (72.1%)
High	0 (0%)	1 (3.1%)	12 (9%)	13 (5.4%)
Child				
Yes	68 (90.7%)	28 (87.5%)	91 (68.4%)	187 (77.9%)
No	7 (9.3%)	4 (12.5%)	42 (31.6%)	53 (22.1%)
Total	75 (100%)	32 (100%)	133 (100%)	240 (100%)

As demonstrated in Table 1, 59 (78.7%) of mastectomy patients, 28 (87.5%) of reconstructive surgery patients and 93 (69.9%) of healthy group are married. In terms of educational levels, a vast majority (64%) of mastectomy patients are elementary and secondary school graduates; a vast majority (40.6%) of reconstructive surgery patients are high-school and a vast majority (72.2%) of healthy group are university graduates. In reconstructive group and healthy ones, the lowest educational level is elementary and secondary while in mastectomy group 12% is only literate. In terms of socioeconomic level in three groups; the highest ratio (alternately 56%, 81.3% and 78.9%) belonged to middle socioeconomic level. In terms of having a child, top ratio (90.7%) belonged to mastectomy group followed by reconstructive group (87.5%) and healthy group (68.4%).

Data on clinical features of patients are as exhibited in Table 2. Mastectomy patients were diagnosed at an approximate age of 48 (±8.23), reconstructive patients at an approximate age of 41 (±5.17). In both patient groups it was seen that surgery was performed in a relatively short waiting interval (one year) after diagnosis age. In

terms of surgery type a vast majority of both patient groups underwent total mastectomy.

Psychometric Instruments

Personal Information Form: Since in the study two distinctive groups existed- those diagnosed with breast-cancer and healthy ones free from breast cancer- two individualized Personal Information Forms were developed and administered. In the Information Form of participants with breast-cancer, date of birth, marital status, education level, mean annual income level, number of children, comorbid chronic diseases, diagnosis age, duration after the diagnosis, applied therapies, date of surgical operation, duration after the surgery, surgery type, breast reconstruction, and level of satisfaction with reconstructive operation were listed. In the Information Form of Healthy participants; date of birth, marital status, education level, average annual income level, and number of children were listed.

The Self-Efficacy Scale: Developed by Sherer et al the scale contains 23 items (18). Turkish validity and reliability studies of the scale was performed by Yildirim

Table 2: Data on the clinical features of participants

Diagnosis age	n	Mean	SD	Min.	Max.		
Mastectomy	75	48.17	8.23	30	64		
Reconstructive surgery	32	40.56	5.08	31	50		
Total	107	45.90	8.19	30	64		
Surgery age	n	Mean	SD	Min.	Max.		
Mastectomy	75	48.8	8.85	30	77		
Reconstructive surgery	32	41.03	5.17	31	51		
Total	107	46.48	8.68	30	77		
Length of surgery (month)	n	Mean	SD	Min.	Max.		
Mastectomy	75	40.41	38.05	4	144		
Reconstructive surgery	32	38.28	30.51	6	108		
Total	107	39.78	35.83	4	144		
Groups	Mastectomy		Reconstructive surgery		Total		
Surgery type	n	%	n	%	n	%	
Total mastectomy	70	93.3	20	62.5	90	84.1	
Modified radical mastectomy	5	6.7	12	37.5	17	15.9	

SD: Standard Deviation

and Ilhan (19). At the end of factor analyses, Magaletta and Oliver deducted the scale into 17 items (20). Each question received a score in the range of 1 to 5. Items 2, 4, 5, 6, 7, 10, 11, 12, 14, 16, 17 were inversely scored and total score of the scale varied between 17 and 85. A higher score from the scale indicated elevated level of self-efficacy belief. Cronbach's alpha coefficient of Turkish version corresponded to 0.80, split-half reliability coefficient was 0.77, test-retest reliability correlation coefficient was 0.69. Factor structure of the scale was analyzed via exploratory factor analysis in which a three-factor structure with an eigenvalue above one and which explained 41.5% of total variance was then obtained. These factors were respectively such; 'initiating self-efficacy belief', 'sticking to self-efficacy belief' and 'striving to sustain self-efficacy belief' subscales (19).

Coopersmith Self-Esteem Scale: Developed by Coopersmith (21) the scale's adaptation to Turkish language was conducted by Turan and Tufan (22). Scale's adult version consists of 25 items that had choices such as "like me" or "unlike me". An increase in total score indicated an elevated level of self-esteem. In the scale each positive statement was given "4" points; each negative statement was given "0" point and the scale had a total score range between 0–100. In the reliability analysis, Turan and Tufan used the scale among 30 cancer patients with a mean age of 45 at 15-day breaks. In test-retest process of the scale reliability coefficient was measured as 0.65. In addition, at the end of test-retest process applied to 56 university students with a mean age of 20 the coefficient was measured as 0.76 at 15-day breaks. Scale's correlation with Rosenberg Self-esteem Scale was computed as 0.62 (22).

Beck Depression Inventory: Developed by Beck, Ward, Mendelson, Mock and Erbaugh (23) the scale's validity and reliability analysis was conducted in Turkey by Hisli (24). This is a self-report scale in which perceived depression symptoms are quantitatively assessed. Any item in the scale determines a behavioral pattern indicative of depression. The scale consists of 21 self-assessment statements that receive a score range between 0–3. Minimum score that can be received from Beck Depression Inventory is zero; maximum score is 63. An increase in score corresponds to a surge in depression symptoms. In reliability analysis of the inventory split-half reliability coefficient was computed as 0.74, in item analysis Cronbach's alpha coefficient was computed as 0.80. In concurrent validity analysis, together with BDI,

MMPI depression subscale was applied and correlation coefficient in between was measured as 0.50 (24).

Study Procedure

After obtaining required approvals of University Ethics Committee (2017/41) and Provincial Directorate of Health (604.01.02), mastectomy and post-mastectomy reconstructive operation patients having applied to Medical Oncology Clinic and Breast Policlinic of the City Hospital and healthy control group were given Informed Consent Forms. Data were collected gradually between January and July in 2018.

Statistical Analysis

To prevent any data loss, items of the scale were read by the researcher and marked by the participants. Implementation process of scales lasted around 30 minutes. Collected data were analyzed via IBM SPSS Statistics for Windows, version 25 (IBM Corp., Armonk, NY, USA) program. Before the analyses, normality, linearity, homogeneity and collinearity status of data were examined; it was then identified that assumptions of parametric tests were violated. Hence in all the analyses nonparametric tests such as Mann-Whitney U, Kruskal-Wallis H and Spearman Rho correlation techniques were harnessed.

RESULTS

Depression, Self-Esteem and Self-Efficacy Beliefs of Mastectomy Patients, Post-Mastectomy Reconstructive Patients and Healthy Control Group

In order to test if a significant difference existed among groups with respect to depression scores, Kruskal-Wallis H test was performed and a significant difference was identified among groups ($\chi^{2(2)}$=41.22, p=0.000, η^2=0.165). Mean rank of mastectomy group (162.96) was significantly higher than the mean rank of reconstructive surgery patients (107.39) and healthy group (99.71). In addition, it was identified that this difference also had a large effect size. In this study; although it was indicated that age,

education level and income level could be confounding variables and it was planned to use Analysis of Covariance (ANCOVA), the analysis was not performed since assumptions of ANCOVA were violated. Even though assumptions could not be met, age, education level and income level were taken as control variables, and ANCOVA was performed to test the difference between depression levels of groups. It was seen that the same differentiation that we found in Kruskal-Wallis H test surfaced again.

So as to test if a significant difference existed between groups with respect to self-esteem scores Kruskal-Wallis H test was applied and a significant difference was tracked among groups ($\chi^{2(2)}$=72.17, p=0.000, η^2=0.296). Mean rank of mastectomy group (64.20) was found to be significantly lower than the mean ranks of reconstructive surgery patients (147.52) and healthy group (145.75). In addition it was identified that this difference also had a large effect size.

So as to test if a significant difference existed among groups with respect to self-efficacy scores Kruskal-Wallis H test was applied and significant differences were found in between the groups ($\chi^{2(2)}$=93.47, p=0.000, η^2=0.386). Mean rank of mastectomy group (56.89) was found to be significantly lower than the mean ranks of reconstructive surgery patients (164.27) and healthy group (145.84). In addition it was identified that this difference also had a large effect size.

Although it was indicated that in self-esteem and self-efficacy analyses, age, depression, education level and income level could be confounding variables and it was planned to use Multivariate Analysis of Covariance (MANCOVA), the analysis was not performed since assumptions of MANCOVA were violated. Even though assumptions could not be met, in order to check whether or not analysis results changed, age, depression, education level and income level were taken as control variables; by taking self-esteem and self-efficacy scores as dependent variables it was tested if a significant difference existed in between the groups. It was seen that the same differentiation that we found in Kruskal-Wallis H test surfaced again.

Depression, Self-Esteem and Self-Efficacy Beliefs with Respect to Surgery Type

Mann-Whitney U test revealed that depression mean rank (58.45) of total mastectomy patients was significantly higher than mean rank (30.44) of modified radical mastectomy patients (U=364.5, p=0.001, η^2=0.109).

Mann-Whitney U test yielded that self-esteem mean rank (49.04) of total mastectomy patients was significantly lower than the mean rank (80.26) of modified radical mastectomy patients (U=318.50, p=0.000, η^2=0.135).

Mann-Whitney U test showed that self-efficacy mean rank (51.19) of total mastectomy patients was significantly lower than the mean rank (68.88) of modified radical mastectomy patients (U=512.0, p=0.031, η^2=0.043).

Depression, Self-Esteem and Self-Efficacy Beliefs with Respect to Treatment Combinations After Diagnosis

Treatments after a diagnosis are provided as chemotherapy (CT), radiotherapy (RT), hormonal therapy (HT) and surgical operation (O). These treatments are applied in four different combinations as CT+O, CT+RT+O, CT+HT+O and CT+RT+HT+O. In order to test if any significant difference existed among these four treatment combinations with respect to depression scores, Kruskal-Wallis H test was performed and a significant difference was then detected among groups ($\chi^{2(3)}$=13.14, p=0.004, η^2=0.384). Depression-score mean rank (26.29) of patients having received CT+HT+O treatment combination was found to be significantly lower than the patients having received other treatment combinations.

In order to test if any significant difference existed among treatment combinations with respect to self-esteem scores, Kruskal-Wallis H test was applied and a significant difference was then detected among groups ($\chi^{2(3)}$=16.58, p=0.001, η^2=0.132). Self-esteem score mean rank (79.89) of patients having received CT+HT+O treatment combination was found to be significantly higher than the patients having received other treatment combinations.

In order to test if any significant difference existed among treatment combinations with respect to self-efficacy scores, Kruskal-Wallis H test was conducted and a significant difference was then detected among groups ($\chi^{2(3)}$=21.24, p=0.000, η^2=0.177). Self-efficacy score mean rank (88.57) of patients having received CT+HT+O treatment combination was found to be significantly higher than the patients having received other treatment combinations.

Reconstructive Operation Age and Level of Satisfaction with the Reconstructive Operation

There was not an identified significant relationship between reconstructive operation age and level of satisfaction with the reconstructive operation (rho=-0.10, p=0.581, n=32).

DISCUSSION

The findings of the research concluded that there was a parallelism with respect to mean age, diagnosis age, surgery age, duration after the surgery and surgery type between mastectomy patients and post-mastectomy reconstructive operation patients. In the research the fact that diagnosis age was 40 and above draws parallelism with previous findings indicating that breast cancer climbed with older age (25) and risk for getting breast cancer tended to increase sharply (4). It was detected in both groups that ratio of performing total mastectomy was higher than modified radical mastectomy. Sertöz Önen, Elbi Mete, Noyan, Alper, and Kapkaç's findings revealing that total mastectomy is a more prevalent procedure in early-stage breast-cancer surgery are similar to the findings of our research (26). As for marital status it is seen that a majority of mastectomy patients and post-mastectomy reconstructive operation patients are married and this finding is in line with the literature (27-29). Our research concluded that mastectomy patients were elementary and secondary education graduates; reconstructive operation patients were high-school graduates. Our findings on mastectomy patients are similar to Matrai et al.'s research findings (28); different studies reveal that there is variability in the education levels of reconstructive operation patients (27,29,30). Patients in both groups were found to have middle

socioeconomic level. This is a finding similar to Kim et al.'s research results (31). Research results of Lee et al (27), Tsai, Kuo and Chung demonstrate that mastectomy patients had low socioeconomic level (29); Hvilsom et al and Morrow et al.'s findings show that post-mastectomy reconstructive patients have higher socioeconomic level but these findings are in contradiction with our research findings (30,32). Besides the study conducted in Turkey by Sertöz et al showed that patients with total mastectomy had lower education and income levels compared to reconstructive operation patients (26).

In our research findings, depression level of mastectomy patients was above the level of post-mastectomy reconstructive patients and healthy group. Research data of Al-Ghazal, Fallowfield and Blamey are identical to our findings on depression (11). They report that depression level of mastectomy patients is higher than post-mastectomy reconstruction patients and breast-conserving surgery patients. Research results of Al-Ghazal, Sully, Fallowfield and Blamey, Rubino, Figus, Lorettu and Sechi, Sun et al support our findings (14,33,34). On the other hand in the study of Harcourt et al, it was seen that compared to reconstructive operation patients, there is only one-year lasting depression in mastectomy patients and at the end of one year depression levels become identical (35).

Analyses demonstrate that among mastectomy patients, post-mastectomy reconstructive operation patients and healthy control group, a significant difference existed with respect to self-esteem scores. It was detected that compared to other groups self-esteem level of mastectomy patients were lower. In relevant literature a number of studies are in line with our findings. In the study of Al-Ghazal, Fallowfield and Blamey analyzing the effects of surgery operations performed on breast cancer patients, it surfaced that mastectomy patients had lower levels of self-esteem (11). Also in the studies conducted by Ha and Cho, Sun et al, it was apparent that mastectomy patients had, compared to other surgery patients, lower self-esteem levels (12,14).

With respect to self-efficacy scores a significant difference existed among mastectomy patients, post-mastectomy reconstructive operation patients and

healthy control group. In mastectomy patients a lower level of self-efficacy belief was measured. If we examine this finding in relation to the insight that mastectomy patients have a higher depression level, it can be concluded that self-efficacy belief and depression affect one another in a significant ratio. At the end of Foster et al.'s study, it surfaced that low self-efficacy belief is in connection with the pessimism which stems from depression (16). Adachi, Ueno, Fujioka, Fujitomi and Ueo on the other hand manifested that self-efficacy belief is a vital variable in depression therapy (36).

It is determined that a significant difference existed among depression, self-esteem and self-efficacy scores with respect to surgery type. In relevant literature a number of studies indicate that among breast-cancer patients, applied surgery techniques can leave psychological effects on a patient (11,14,31,37,38). In this study too, it was identified that compared to modified radical mastectomy patients, total mastectomy patients had higher level of depression, lower self-esteem and self-efficacy beliefs. In Turkey a research by Akça, Ata, Nayır, Erdoğdu and Arıcan showed that unlike total mastectomy patients, modified radical mastectomy patients entertained better cognitive, affective and social functions (39). It is viable to argue that the operation is effective on one's depression level which in effect can impact self-esteem and self-efficacy beliefs.

According to the results of analyses, applied treatment combinations after a diagnosis have significant effects on depression, self-esteem and self-efficacy scores. It surfaced that patients having received "chemotherapy + hormonal therapy and surgical operation (CT+HT+O)" demonstrated lower depression symptoms, higher levels of self-esteem and self-efficacy beliefs when compared with other therapies. It can thus be argued that after a diagnosis optimal treatment procedure is "chemotherapy + hormonal therapy and surgical operation". Recent studies have shown that chemotherapy and hormonal therapy combination increased one's life span (40). After radiotherapy the patient undergoes severe physical pains and burns (41,42). It is suggested that such long-term side effects in radiotherapy may have a stronger devastating effect on patients.

Our research concluded that not any significant relationship existed between reconstruction age and satisfaction level with the reconstruction procedure. In contrast to the finding of our research, Al-Ghazal, Sully, Fallowfield et al detected that as reconstruction age rose, satisfaction level with the reconstruction procedure also increased (33).

Limitations and Lmplications for the Future Research

Despite being a pioneering study in dealing with self-efficacy beliefs of mastectomy and post-mastectomy reconstructive operation patients, this study still has its own limitations. Sample of this research consists of breast-cancer patients having applied to the Medical Oncology Clinic and Breast Policlinic in a local City Hospital. Hence findings of our study can hardly be generalized. It is suggested to implement similar studies across large-scale samples both in Turkey and in other countries. Second important limitation is that although people who were taken any psychiatric diagnosis were excluded from study group, antidepressant treatment use which could strongly affect the evaluated psychological properties in the study population was not examined. Third, data were collected gradually between January and July in 2018. However, time distance between operation date and administration date of scales were different among patients. It should be considered that post-operative scale scores are probably time-depended. For instance, BDI scores would be different for the same patient when applied three days after and one month after the surgical procedure. Finally, in relevant literature it is seen that a myriad of studies examined self-esteem and depression level of breast cancer patients.

Our finding, which losing breast diminished patient's self-efficacy belief in a breast-cancer treatment, should be retested in future studies. In breast-cancer treatment it is suggested that future studies shed more light on the effects of applied surgical operations on patients. Also it would be beneficial to further analyze CT+HT+O treatment combination obtained in this study in regard to causing identical depression, self-esteem and self-efficacy effects on other samplings too.

REFERENCES

1. Akram M, Iqbal M, Daniyal M, Khan AU. Awareness and current knowledge of breast cancer. Biol Res 2017;50(1):33-56.[CrossRef]
2. Denizgil T, Sonmez I. Comparison of self-esteem, body image, sexual satisfaction and sexual experiences between women who has mastectomy or breast conserving surgery for breast carcinoma. [Meme kanseri nedeni ile meme koruyucu cerrahi geçirmiş kadınlarla mastektomi operasyonu geçirmiş kadınlar arasında benlik saygısı, beden algısı, cinsel doyum ve cinsel yaşantıların karşılaştırılması]. Yeni Symposium 2015;53(3):17-25. [Turkish]
3. Siegel RL, Miller KD, Jemal A. Cancer statistics. CA Cancer J Clin 2019;69(1):7-34. [CrossRef]
4. World Health Organization (2018, September 12). International agency for research on cancer. Latest global cancer data (Press release no 263). Retrieved from https://www.iarc.fr/wp-content/uploads/2018/09/pr263_E.pdf
5. Lundqvist A, Andersson E, Ahlberg I, Nilbert M, Gerdtham U. Socioeconomic inequalities in breast cancer incidence and mortality in Europe-a systematic review and meta-analysis. Eur J Public Health 2016;26(5):804-13. [CrossRef]
6. Carroll AJ, Baron SR, Carroll RA. Couple-based treatment for sexual problems following breast cancer: A review and synthesis of the literature. Support Care Cancer 2016;24(8):3651-9. [CrossRef]
7. Male DA, Fergus KD, Cullen K. Sexual identity after breast cancer: sexuality, body image, and relationship repercussions. Curr Opin Support Palliat Care 2016;10(1):66-74. [CrossRef]
8. Recio-Saucedo A, Gerty S, Foster C, Eccles D, Cutress RI. Information requirements of young women with breast cancer treated with mastectomy or breast conserving surgery: A systematic review. The Breast 2016;25:1-13. [CrossRef]
9. Fang SY, Shu BC, Chang YJ. The effect of breast reconstruction surgery on body image among women after mastectomy: A meta-analysis. Breast Cancer Res Treat 2013;137(1):13-21.
10. Lee GK, Sheckter CC. Breast reconstruction following breast cancer treatment-2018. JAMA 2018;320(12):1277-8. [CrossRef]
11. Al-Ghazal SK, Fallowfield L, Blamey RW. Comparison of psychological aspects and patient satisfaction following breast conserving surgery, simple mastectomy and breast reconstruction. Eur J Cancer 2000;36(15):1938-43. [CrossRef]
12. Ha EH, Cho YK. The mediating effects of self-esteem and optimism on the relationship between quality of life and depressive symptoms of breast cancer patients. Psychiatry Investig 2014;11(4):437-45. [CrossRef]
13. Han J, Grothuesmann D, Neises M, Hille U, Hillemanns P. Quality of life and satisfaction after breast cancer operation. Arch Gynecol Obstet 2010;282(1):75-82. [CrossRef]

14. Sun Y, Kim SW, Heo CY, Kim D, Hwang Y, Yom CK, Kang E. Comparison of quality of life based on surgical technique in patients with breast cancer. JPN J Clin Oncol 2014;44(1):22-7.

15. Bandura A. Self-Efficacy: the exercise of control. New York: Freeman, 1997, p.31.

16. Foster C, Breckons M, Cotterell P, Barbosa D, Calman L, Corner J, et al. Cancer survivors' self-efficacy to self-manage in the year following primary treatment. J Cancer Surviv 2015;9(1):11-9. [CrossRef]

17. Porter LS, Keefe FJ, Garst J, McBride CM, Baucom D. Self-efficacy for managing pain, symptoms, and function in patients with lung cancer and their informal caregivers: Associations with symptoms and distress. Pain 2008;137(2):306-15. [CrossRef]

18. Sherer M, Maddux JE, Mercandante B, Prentice-Dunn S, Jacobs B, Rogers RW. The Self-efficacy Scale: construction and validation. Psychol Rep 1982;51(2):663-71. [CrossRef]

19. Yildirim F, Ilhan IO. The validity and reliability of the general self-efficacy scale-Turkish form [Genel Öz Yeterlik Ölçeği Türkçe formunun geçerlilik ve güvenilirlik çalışması]. Turkish J Psychiatry 2010;21(4):301-8. [Turkish]

20. Magaletta PR, Oliver JM. The hope construct, will, and ways: Their relations with self-efficacy, optimism, and general well-being. J Clin Psychol 1999;55(5):539-51. [CrossRef]

21. Coopersmith S. The antecedents of self-esteem. San Francisco: WH Freeman and Company, 1967.

22. Turan N, Tufan B. Validity and reliability study of Cooopersmith self-esteem scale [Coopersmith Benlik Saygısı Envanteri'nin (SEI) geçerlik-güvenirlik çalışması] in 23. National Psychiatry and Neurological Sciences Congress Book (pp. 817-818), Istanbul, 1987. [Turkish]

23. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry 1961;4:561-71. [CrossRef]

24. Hisli N. A validity and reliability study of Beck depression inventory in a university student sample [Beck Depresyon Envanterinin üniversite öğrencileri için geçerliği, güvenirliği]. J Psychol 1989;7(23):3-13. [Turkish]

25. Eti Aslan F, Gurkan A. The risk of breast cancer at the women [Kadınlarda meme kanseri risk düzeyi]. J Breast Health [Meme Sağlığı Dergisi] 2007;3(2):63-8. [Turkish]

26. Sertoz Onen O, Elbi Mete H, Noyan A, Alper M, Kapkac M. Effects of surgery type on body image, sexuality, self-esteem, and marital adjustment in breast cancer: A controlled study [Meme kanserinde ameliyat tipinin beden algısı, cinsel işlevler, benlik saygısı ve eş uyumuna etkileri: kontrollü bir çalışma]. Turkish J Psychiatry 2004;15(4):264-75. [Turkish]

27. Lee CN, Deal AM, Huh R, Ubel PA, Liu YJ, Blizard L, et al. Quality of patient decisions about breast reconstruction after mastectomy. JAMA Surg 2017;152(8):E1-E8. [CrossRef]

28. Mátrai Z, Kenessey I, Sávolt Á, Újhelyi M, Bartal A, Kásler M. Evaluation of patient knowledge, desire and psychosocial background regarding postmastectomy breast reconstruction in Hungary: A questionnaire study of 500 cases. Med Sci Monit 2014;20:2633-42. [CrossRef]

29. Tsai HY, Kuo RNC, Chung K. Quality of life of breast cancer survivors following breast-conserving therapy versus mastectomy: a multicenter study in Taiwan. JPN J Clin Oncol 2017;47(10):909-18. [CrossRef]

30. Hvilsom GB, Hölmich LR, Frederiksen K, Steding-Jessen M, Friis S, Dalton SO. Socioeconomic position and breast reconstruction in Danish women. Acta Oncol 2011; 50(2):265-73. [CrossRef]

31. Kim MK, Kim T, Moon HG, Jin US, Kim K, Kim J, et al. Effect of cosmetic outcome on quality of life after breast cancer surgery. Eur J Surg Oncol (EJSO) 2015;41(3):426-32. [CrossRef]

32. Morrow M, Mujahid M, Lantz PM, Janz NK, Fagerlin A, Schwartz K, et al. Correlates of breast reconstruction. Cancer 2005;104(11):2340-6. [CrossRef]

33. Al-Ghazal SK, Sully L, Fallowfield L, Blamey RW. The psychological impact of immediate rather than delayed breast reconstruction. Eur J Surg Oncol 2000;26(1):17-9. [CrossRef]

34. Rubino C, Figus A, Lorettu L, Sechi G. Post-mastectomy reconstruction: A comparative analysis on psychosocial and psychopathological outcomes. J Plast Reconstr Aesthet Surg 2007;60(5):509-18. [CrossRef]

35. Harcourt DM, Rumsey NJ, Ambler NR, Cawthorn SJ, Reid CD, Maddox PR, et al. The psychological effect of mastectomy with or without breast reconstruction: A prospective, multicenter study. Plast Reconstr Surg 2003;111(3):1060-8. [CrossRef]

36. Adachi K, Ueno T, Fujioka T, Fujitomi Y, Ueo H. Psychosocial factors affecting the therapeutic decision-making and postoperative mood states in Japanese breast cancer patients who underwent various types of surgery: Body image and sexuality. JPN J Clin Oncol 2007;37(6):412-8. [CrossRef]

37. Sun MQ, Meng AF, Huang XE, Wang MX. Comparison of psychological influence on breast cancer patients between breast-conserving surgery and modified radical mastectomy. Asian Pac J Cancer Prev 2013;14(1):149-52. [CrossRef]

38. 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(7):2076-85. [CrossRef]

39. Akca M, Ata A, Nayir E, Erdogdu S, Arican A. Impact of surgery type on quality of life in breast cancer patients. J Breast Health 2014;10(4):222-8. [CrossRef]

40. Topuz E, Uygun K, Aydiner A. Systemic treatment in breast cancer [Metastatik meme kanserinde sistemik tedavi] in Breast Cancer [Meme Kanseri] (1st Edition), pp.485-509, Istanbul: Nobel Tip Kitapevleri, 2003.

41. Bray FN, Simmons BJ, Wolfson AH, Nouri K. Acute and chronic cutaneous reactions to ionizing radiation therapy. Dermatology Ther 2016;6(2):185-206. [CrossRef]

42. Cathrine Lauridsen M, Overgaard M, Overgaard J, Hessov IB, Cristiansen P. Shoulder disability and late symptoms following surgery for early breast cancer. Acta Oncol 2008;47(4):569-75.