

## Original Article

**Cite this article:** Tsantakis V, Dimitroulis D, Kontzoglou K, Nikiteas N (2024) The effect of time since reconstruction on breast cancer patients' quality of life, self-esteem, shame, guilt, and pride. *Palliative and Supportive Care* 22(5), 1035–1041. <https://doi.org/10.1017/S1478951523000445>

Received: 09 January 2023

Revised: 17 March 2023

Accepted: 28 March 2023

**Keywords:**

Breast cancer; Breast reconstruction; Guilt; Quality of life; Self-esteem

**Corresponding author:**

Vlasios Tsantakis;

Email: [vlatsa@hotmail.it](mailto:vlatsa@hotmail.it)

# The effect of time since reconstruction on breast cancer patients' quality of life, self-esteem, shame, guilt, and pride

Vlasios Tsantakis, B.Sc.<sup>1,2</sup> , Dimitrios Dimitroulis, Ph.D.<sup>3</sup>,

Konstantinos Kontzoglou, Ph.D.<sup>3</sup> and Nikolaos Nikiteas Ph.D.<sup>3</sup>

<sup>1</sup>Faculty of Medicine, National and Kapodistrian University of Athens, Attica, Greece; <sup>2</sup>Department of Plastic Reconstructive and Aesthetic Surgery, Geniko Ogologiko Nosokomeio Kifisias – Agioi Anargiroi, Attica, Greece and <sup>3</sup>Second Department of Propedeutic Surgery Athens, Laiko General Hospital, Attica, Greece

**Abstract**

**Objectives.** The aim of this study was to investigate the impact of breast reconstruction time (immediate/at a later time) on women's quality of life, self-esteem, feelings of guilt, and shame. In addition, the study aimed to investigate the association between time till reconstruction in women with later reconstruction on these parameters.

**Methods.** Data collection for the study was conducted from a sample of 150 women with breast cancer who had undergone reconstruction. Breast-Q, Rosenberg Self-Esteem Scale, and State Shame and Guilt Scale questionnaires were used to study the above variables.

**Results.** Immediate reconstruction was associated with higher psychosocial and sexual well-being scores ( $p = 0.014$  and  $0.016$ , respectively). No other quality of life parameters, neither self-esteem, nor feelings of guilt, shame, and pride, were associated with having a mastectomy and reconstruction at the same time or not. Furthermore, for women who did not have immediate reconstruction, the time elapsed until reconstruction was not associated with quality of life, self-esteem, feelings of guilt, shame, and pride.

**Significance of results.** This study highlights the importance of simultaneous mastectomy and breast reconstruction, as it is associated with higher psychosocial and sexual quality of life. Therefore, simultaneous breast reconstruction is imperative to be provided by health systems.

**Introduction**

Breast cancer is a dominant threat to global public health. In the United States, the incidence of breast cancer has been increasing over the past 4 decades. At the same time, mortality due to breast cancer is decreasing, thanks to advances in therapeutic treatments and diagnosis at earlier stages. Thus, in this country, there is an ever-increasing population of breast cancer survivors (Giaquinto et al. 2022). A similar situation is observed in other regions of the developed world, such as Europe (Zielonke et al. 2020). At the same time, in regions of the developing world where life expectancy has traditionally been very low, such as some undeveloped regions of Asia, the increase in life expectancy in recent decades has also led to an increase in the total number of breast cancer patients (Youn and Han 2020). Therefore, for reasons that differ between the developed and the developing world, there is a significant increase in the total number of women with breast cancer.

In addition to the emphasis on the therapeutic needs of breast cancer patients, considerable emphasis has also to be given on their psychosocial needs. Since the breast is identified with femininity, breast cancer and painful treatment procedures, such as mastectomy, radically impact the patients' representation of themselves (Berterö and Wilmoth 2007). It is undeniable that the self-esteem of women with breast cancer is affected as a function of the change in their body image (Carpenter et al. 1999). The lower levels of self-esteem of women with breast cancer are found through comparative analyses with healthy women. For example, a related study in Poland comparing 170 patients who had undergone mastectomy 5 years ago and 149 women who had never been diagnosed with breast cancer found that the former group had lower self-esteem scores (Tarkowska et al. 2020). Therefore, improving self-esteem is considered a primary goal of interventional mental health enhancement programs in women with breast cancer (Pelekasis et al. 2016).

More generally, perceptions about the self change significantly due to the disease. Women with breast cancer often feel low pride, significant guilt, and intense shame (Solikhah et al. 2020). The belief that neglect of necessary health behaviors contributed to the development of the disease is significantly associated with these feelings (LoConte et al. 2008). Managing these perceptions becomes imperative as they are associated with more intense anxiety and depression for women with breast cancer (Hill et al. 2011).

© The Author(s), 2023. Published by Cambridge University Press. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted re-use, distribution and reproduction, provided the original article is properly cited.

As a function of the above, and the general experience of the disease, the quality of life of women with breast cancer appears to be significantly affected. Quality of life levels are affected in the phase immediately after diagnosis due to the intense mental and physical burden on women (Chen et al. 2022; Oh and Cho 2020). Moreover, even 5 years after the end of the relevant treatment regimens, it appears that there are still significant quality of life-related issues, for example cognitive decline, sleep disturbances, and issues related to sexuality (Schmidt et al. 2018). Therefore, breast cancer generally affects women's quality of life.

Given the significant negative impact of the disease on patients and the long period of time over which they now survive the disease, it is necessary to study the relationship between treatment regimens and disease outcome (Culbertson et al. 2020). Immediate reconstruction appears to have a beneficial effect on the quality of life, as based on a related study in Sweden, the quality of life levels of women undergoing immediate reconstruction are the same as those of the general population of women 1 year after completion (Elder et al. 2005). However, on the one hand, constantly updated data and recent studies are needed to draw relevant conclusions, and on the other hand, with regard to certain mental health parameters, the difference between immediate and later reconstruction has not been examined, but the difference between reconstruction and no reconstruction. For example, a related study in Brazil found that women who had undergone breast reconstruction had higher self-esteem scores compared to those who had not undergone reconstruction (Gomes and Silva 2013). Yet, it is not clear whether a similar pattern occurs for women who proceeded with immediate and later reconstruction. Also, research to date has not studied the relationship between the time to reconstruction in women who did not undergo concurrent reconstruction in relation to parameters of mental health and quality of life. In general, research on the psychosocial effects of reconstruction in women with breast cancer is characterized by considerable heterogeneity between studies and has also led to several contradictory findings, factors that highlight the need for further research (Heimes et al. 2017).

Based on the above, the objectives of this study were as follows:

- 1) to examine the difference in quality of life, self-esteem, pride, shame, and guilt between women who had and had not undergone breast reconstruction
- 2) to examine the relationship between the time to reconstruction for women who had not undergone simultaneous reconstruction and the above parameters

## Methods

### Study design

The present study was quantitative and cross-sectional. Thus, all assessments were carried out without prospective assessment of the patients. A comparative design was utilized for the first objective of the study, in order to search for differences based on immediate/late reconstruction. In addition, a correlational analysis was utilized for the second objective since both variables were numeric.

### Participants

The inclusion criteria for this study were the following:

- (1) Having received a breast cancer diagnosis

- (2) Having received mastectomy
- (3) Having received breast reconstruction

The exclusion criteria were the following:

- (1) Diagnosis of dementia or any other syndrome affecting the patients' ability to complete the study assessments
- (2) Limited knowledge of Greek language, debarring the participants' ability to complete the assessments

The inclusion and exclusion criteria were assessed by the participants' medical records. The two exclusion criteria were also orally assessed prior to study recruitment.

## Measures

### Sociodemographic and medical data

Participants' sociodemographic data included age (years), marital status (unmarried/married/divorced/widowed), employment status (employed/unemployed/retired), previous in vitro fertilization (IVF) (yes/no), number of children, parents' place of origin (open question), country or city where they grew up (open question), previous treatments (chemotherapy/radiotherapy/hormone therapy/immunotherapy), date of completion of treatment (year and month), whether they are currently receiving any treatment (yes/no), type of treatment currently received (hormone therapy/immunotherapy/other), time since first diagnosis of the disease (years), family history of cancer, of any type, in a member of the extended family (yes/no), concomitant diseases (none/hypertension/diabetes/musculoskeletal/cardiovascular/other), and whether mastectomy and reconstruction have been performed together or at a later time (open question).

### Breast-Q version 2.0

Breast-Q version 2.0 is a category of questionnaires that assess individual aspects of satisfaction and well-being of cancer patients through questions that take values from 1 (not at all) to 5 (all the time) (Memorial Sloan Cancer Center 2017). The subscales used in this study and the associated Cronbach's level in this study were as follows:

1. psychosocial well-being (0.97)
2. sexual well-being (0.96)
3. Satisfaction with breasts (0.96)
4. Satisfaction with implants (0.94)
5. Physical well-being: chest (0.91)
6. Satisfaction with nipple reconstruction (Cronbach was not calculated as it consisted of only one question)
7. Patient experience: satisfaction with information (0.96)
8. Satisfaction with surgeon (0.97)
9. Satisfaction with the medical team (0.95)
10. Satisfaction with office staff (0.97)

### The Rosenberg Self-Esteem Scale Questionnaire

The Rosenberg Self-Esteem Scale (RSES) is a self-report instrument with 10 questions answered on a Likert scale of 1 (strongly agree) to 4 (strongly disagree). Half of the questions are positive and half are negative. The scores of the individual questions are summed to a total score that reflects the respondent's overall self-esteem. High scores mean high self-esteem and low scores mean low self-esteem (Rosenberg 1965). The standardized Greek version of this instrument (Galanou et al. 2014) was used in the present study. In this study, the  $\alpha$  level was 0.84.

### The State Shame and Guilt Scale

The State Shame and Guilt Scale consists of 15 questions that assess levels of shame and guilt on a Likert scale ranging from 1 (not at all) to 5 (absolutely) (Marschall et al. 1994). This scale was translated into Greek using the back-forward method, in congruence with guidelines from previous literature (Maneesriwongul and Dixon 2004). In this study, the Cronbach's  $\alpha$  was 0.71 for shame, 0.75 for guilt, and 0.86 for pride.

### Procedures

The data collection of the study was carried out by the General Oncology Hospital of Kifissia "Agioli Anargyroi" in Greece, following a relevant decision of the hospital's Ethics Committee (15912/01.10.2018). In particular, participants were informed about participation in the study by a medical specialist, who also administered the study measurement. The information took place following their hospital visits for health reasons related to breast cancer (e.g., preventive follow-up). Subsequently, women who wished to participate signed a written consent form and were given the study measurements. Participants were stressed on the anonymity and confidentiality of their participation, told that the data would be used solely for research purposes, and told that they could terminate their participation in the study even if they had initially agreed to participate in the research. Subsequently, they either completed the measurements on the spot or returned them on another day, following an agreed appointment. In addition, since some participants were from rural areas, they returned the measurements by post for convenience. Data collection lasted from October 2018 to October 2020. After this period, the data were entered into an SPSS database to be analyzed.

### Statistical analysis

Statistical analysis of the survey data was carried out using the SPSS statistical program for Windows. Initially, descriptive statistics were used to calculate the sociodemographic characteristics of the study sample. Subsequently, a study of the normality of the distribution of the dependent variables was carried out to determine whether or not the normality of the distribution was violated. Subsequently, the relationship between simultaneous or not reconstruction and time since reconstruction and the values of the 3 self-report questionnaires was studied, based on an inductive statistical analysis. The relationship between immediate vs. later reconstruction and the questionnaires' score was analyzed through Independent Samples T-test, when normality was not violated, and through Mann-Whitney U test, when normality was violated. The association between time till reconstruction and the questionnaires' score was analyzed through Pearson's Correlation, when normality was not violated, and Spearman's Correlation, when normality was violated. The  $p$  value was set at 0.05 for all the analyses.

### Results

The sociodemographic data of the participants are presented at Tables 1 and 2. As indicated by Table 1, most of the study participants were married (67.3%), employed (56.7%), had not undergone IVF (92.7%), had not had a protective mastectomy (74%) and were not currently receiving treatment (51.3%). Of those receiving treatment, the vast majority were receiving hormone therapy (83.6%).

**Table 1.** The qualitative sociodemographic data

	N	%
Unmarried	16	10.7
Married	101	67.3
Widowed	27	18.0
Divorced	6	4.0
Occupational status		
Unemployed	38	25.3
Working	85	56.7
Pensioner	27	18.0
Having received IVF		
Yes	11	7.3
No	139	92.7
Protective mastectomy		
Yes	39	26.0
No	111	74.0
Current treatment		
Yes	73	48.7
No	77	51.3
Type of current treatment		
Chemotherapy	3	4.1
Hormonal treatment	61	83.6
Immune therapy	7	9.6
Other	2	2.7
Cancer in family members		
Yes	95	63.3
No	55	36.7
Other medical problem		
Diabetes	2	1.4
Musculoskeletal	18	12.2
Hypertension	14	9.5
Other cardiovascular problem	3	2.0
Other medical problem	19	12.8
Absence of comorbidities	92	62.2
Time of reconstruction		
Immediate	69	46.0
At a later time	81	54.0

The majority of participants had another family member who also had cancer (63.3%), did not have a comorbidity (62.2%), and had gone into reconstruction at a later time (54%). Further details are shown in the table below.

The following table presents the quantitative sociodemographic variables of the study. As can be seen, the participants had a low mean age, a small number of children, with a considerable standard deviation, and 7.28 years since diagnosis, also with a very large standard deviation.

**Table 2.** The quantitative sociodemographic data

	Age (years)	Number of children	Time since diagnosis (years)
Mean value	51,787	1.54	7.28
<i>N</i>	150	150	143
Standard deviation	8,153	0.895	6.080

**Table 3.** The difference in questionnaire scores based on simultaneous or subsequent reconstruction

	Reconstruction immediately after mastectomy or at a later time	<i>N</i>	Mean Value	Standard deviation	<i>p</i>
Psychosocial well-being	Immediately	67	41,134	8,696	0.014
	At a later time	80	36,137	12,058	
Sexual well-being	Immediately	69	20,188	7,290	0.016
	At a later time	81	17,197	7,465	
Satisfaction with breasts	Immediately	47	49,170	9,974	0.273
	At a later time	25	45,520	13,029	
Satisfaction with implants	Immediately	50	6,400	1,690	0.619
	At a later time	44	6,113	1,990	
Physical well-being: Chest	Immediately	69	16,855	4,528	0.671
	At a later time	80	16,887	4,018	
Satisfaction with nipple reconstruction	Immediately	31	3,060	0.854	0.841
	At a later time	37	3,000	0.913	
Patient experience: satisfaction with information	Immediately	66	48,030	10,566	0.363
	At a later time	79	48,430	12,535	
Satisfaction with surgeon	Immediately	69	41,956	8,090	0.155
	At a later time	81	41,642	10,278	
Satisfaction with medical team	Immediately	69	26,478	3,909	0.679
	At a later time	81	27,148	2,269	
Satisfaction with office staff	Immediately	69	26,202	3,436	0.329
	At a later time	81	26,592	3,353	
RSES	Immediately	69	33,058	4,611	0.228
	At a later time	81	32,185	4,266	
Pride	Immediately	68	20,617	4,074	0.501
	At a later time	79	20,227	4,101	
Guilt	Immediately	67	8,686	3,499	0.544
	At a later time	79	8,367	3,412	
Shame	Immediately	67	9,417	1,634	0.591
	At a later time	81	9,197	1,784	

RSES; Rosenberg Self-esteem Scale.

The difference between those receiving immediate and later reconstruction on the questionnaires of the study is presented in Table 3. As indicated by the table, those receiving immediate reconstruction had higher scores in psychosocial well-being ( $p = 0.014$ ) and sexual well-being ( $p = 0.016$ ). No further significant differences were noted.

**Table 4.** The association between instruments' score and time between mastectomy and reconstruction surgery

	Time	
Psychosocial well-being	R	-0.158
	P	0.169
	N	77
Sexual well-being	R	-0.169
	P	0.138
	N	78
Satisfaction with breasts	R	-0.100
	P	0.650
	N	23
Satisfaction with implants	R	-0.018
	P	0.911
	N	42
Physical well-being: Chest	R	0.113
	P	0.328
	N	77
Satisfaction with nipple reconstruction	R	-0.097
	P	0.574
	N	36
Patient experience: satisfaction with information	R	0.102
	P	0.382
	N	76
Satisfaction with surgeon	R	0.109
	P	0.341
	N	78
Satisfaction with medical team	R	0.016
	P	0.892
	N	78
Satisfaction with office staff	R	0.100
	P	0.385
	N	78
RSES	R	-0.100
	P	0.382
	N	78
Pride	R	-0.098
	P	0.398
	N	76
Guilt	R	0.128
	P	0.272
	N	76
Shame	R	0.125
	P	0.276
	N	

RSES; Rosenberg Self-esteem Scale.



Table 4 presents the analysis between the instruments' score and time between mastectomy and reconstruction surgery. As indicated in the table, no significant associations were noted.

## Discussion

Without a doubt, breast cancer is a chronic disease that significantly affects the mental health of patients (Fortin et al. 2021). Changes in body image have a central role in these negative effects (Helms et al. 2008). In this context, this study examined parameters of breast reconstruction in relation to patients' quality of life, self-esteem, feelings of shame, guilt, and pride. Based on the statistical analysis performed, the following central findings can be drawn:

1. Immediate reconstruction is associated with higher psychosocial and sexual well-being
2. No other parameters of quality of life, but neither self-esteem, nor feelings of guilt, shame, and pride, are associated with having a mastectomy and reconstruction at the same time or not
3. For women who did not undergo simultaneous reconstruction, the time elapsed until reconstruction is not associated with quality of life, self-esteem, , feelings of guilt, shame, and pride.

Based on the above, some theoretical attributions are possible regarding the parameters in relation to which statistically significant relationships were found and not found. With regard to self-esteem, in relation to which no statistically significant relationships were found, it is possible that the final outcome, meaning the existence or nonexistence of reconstruction, is the one affecting the self-esteem levels of women, irrespective of the course till that outcome. Indeed, Gomes and Silva (2013) found that the existence and absence of reconstruction affected self-esteem levels of women with breast cancer, while this study found that the time of reconstruction did not have a significant effect on their self-esteem. Hence, it could be supported that self-esteem levels are affected by the current state of breast reconstruction not by the course of the patients till that final aesthetic outcome.

As for women's feelings of guilt, shame, and pride, these may not differ because these feelings develop following the overall dynamics that arise as a function of the disease. For example, the feelings of guilt that currently arise are a function of the health behaviors that women had developed prior to the development of breast cancer (Shaver and Drown 1986). Based on this theoretical positioning and the findings of this study, it appears that no mechanism for linking these feelings to the differentials that might arise following breast reconstruction emerges.

As mentioned above, one of the findings of this research concerns the link between reconstruction and sexual well-being. In this case, it is possible that higher quality of life is not a function of women's own representation of their body image but of the interaction with their sexual partners (Sheppard and Ely 2008). Therefore, simultaneous breast reconstruction may possibly lead to a more rapid restoration of balance in relationships with the sexual partner after cancer diagnosis and treatment, thus leading to higher sexual well-being in the long term. Indeed, the higher psychosocial well-being scores on the part of women who proceeded to reconstruction at the same time may be explained by higher sexual well-being scores, given that the sexuality of women with breast cancer directly affects their psychosocial well-being (Kornblith and Ligibel 2003).

In any case, the finding of higher psychosocial quality of life on the part of women who had undergone concurrent reconstruction should be considered highly significant. It is a fact that stress is significantly involved in the development of breast cancer (Antonova et al. 2011) and its recurrence (Palesh et al. 2007). Therefore, the contribution of concurrent reconstruction in improving the psychosocial well-being of women with breast cancer can be considered as particularly important not only for their mental but also for their physical health.

Based on the above, it becomes clear that facilitating access to concurrent reconstruction for women with breast cancer is quite important. Among the main barriers identified at the international level is the lack of coverage of reconstruction by insurance funds, with the result that many women, especially those belonging to more vulnerable groups, cannot afford the cost of reconstruction (Retrouvey et al. 2019). However, given the significant impact of simultaneous reconstruction on women's psychosocial and sexual well-being, it may be that it should take place at the same time as treatment. Health systems should take actions to this direction.

In any case, this study faces a number of limitations, which should be mentioned. A key limitation of the research relates to the size of the sample considered. This limitation lies not so much in whether the sample was small or large, but in whether it was sufficient to avoid the relevant error. From a methodological point of view, the inclusion of samples without a formula for calculating the required sample size can lead to Type I and Type II error, that is, incorrect rejection and acceptance of the null hypothesis, respectively (Campbell and Machin 1999). The absence of the use of such a formula in this research is a relative limitation of this research.

Another limitation relates to the taking of measurements during the COVID-19 pandemic. Based on the data from a recent study during the quarantine period in Greece, it seems that in mental health parameters of patients with chronic diseases, such as stress and somatization, there were higher values compared to healthy individuals, while in others such as depression and anxiety, there were not (Louvardi et al. 2020). Another study in China during the early phase of the pandemic found that a significantly high proportion of women with breast cancer, specifically 20.8%, experienced high levels of stress (Li et al. 2020). More generally, the impact of the current pandemic on the mental health of women with breast cancer is unclear, and it is unclear whether the results reflect a general picture of their mental health or a situation that was dynamically shaped under the effects of the COVID-19 pandemic.

Another limitation of this study concerns the quality of the participants' responses as a result of the number of measurements administered. As Robson (2002) states, the more questionnaires administered in a survey, the lower the likelihood of accurate and qualitative responses from participants. Therefore, as a large number of questionnaires were used in this research, which required a large time commitment, this limitation cannot be ignored.

Based on the aim, results, and limitations of this research, it is possible to make a number of recommendations for future research. A first suggestion is to conduct qualitative studies to examine the same subject under consideration. From a methodological point of view, qualitative studies are appropriate for in-depth exploration of participants' attitudes, perceptions, and beliefs about a researched issue (Babbie 2013). In the present study, the study was correlational, thus not being able to study in depth the formation of relevant phenomena. Consequently, a qualitative approach could lead to the study of "unseen aspects" of the issue under study, providing an opportunity for in-depth exploration of parameters such as shame.

A second suggestion would involve the investigation of additional parameters related to women's mental health in relation to breast cancer reconstruction. In this study, parameters of quality of life and mental health not related to psychopathological manifestations were studied. However, it is widely accepted that breast cancer may potentially lead to significant trauma-related psychopathological manifestations. Thus, it is quite common for women to develop post-traumatic stress disorder as a consequence of the particularly intense traumatic event of breast cancer and its treatments, as well as the inability of women to cope with this trauma (Cordova *et al.* 2017; Parikh *et al.* 2015). It could therefore be studied whether breast reconstruction is associated with differences in post-traumatic stress disorder, given that women who proceed directly to reconstruction may also be distinguished by lower levels of post-traumatic stress.

Another suggestion for future research has to do with examining the possible differentiation of the effects of reconstruction based on the cultural context. In this study, given the sample size, no analyses were conducted to investigate a possible differential effect of reconstruction by cultural group. However, it is widely accepted that representations of breast cancer and body image change have a cultural bias, that is, they depend on the way in which the cultural group in question deals with these issues based on the norms they have formed. This finding emerges from multicultural countries and societies, such as that of the United States, where different representations of breast cancer and reconstruction are found among individual cultural groups (Soon *et al.* 2019). Consequently, a similar study could be conducted in our country to investigate whether breast reconstruction leads to different effects on the quality of life of women of different ethnic and cultural groups.

In addition, a third related suggestion has to do with investigating parameters of the relationship with health professionals involved in reconstruction treatment, which may potentially differentiate women's subsequent quality of life. It is widely accepted that the relationship with health professionals when carrying out treatment interventions significantly modulates patients' mental health, both immediately and in the long term (Di Matteo and Martin 2002). Therefore, another proposal has to do with conducting a study to examine the relationship with health professionals involved in breast reconstruction with women's subsequent quality of life.

## Conclusions

This study highlights the importance of simultaneous mastectomy and breast reconstruction, as it is associated with higher psychosocial and sexual quality of life. Therefore, simultaneous breast reconstruction should be promoted in health systems' level.

**Funding.** This research received no specific grants from any funding agency in either the public, commercial, or not-for-profit sector.

**Competing interests.** The authors hereby state that they have no potential conflicts of interest to declare.

## References

- Antonova L, Aronson K and Mueller CR (2011) Stress and breast cancer: From epidemiology to molecular biology. *Breast Cancer Research* 13(2), 208. doi:10.1186/bcr2836
- Babbie ER (2013) *The Basics of Social Research*. Boston: Cengage Learning.

- Berterö C and Wilmoth MC (2007) Breast cancer diagnosis and its treatment affecting the self: A meta-synthesis. *Cancer Nursing* 30(3), 194–202. doi:10.1097/01.NCC.0000270707.80037.4c
- Campbell MJ and Machin D (1999) *Medical Statistics: A Commonsense Approach*, 3rd edn. West Sussex: John Wiley & Sons.
- Carpenter JS, Brockopp DY and Andrykowski MA (1999) Self-transformation as a factor in the self-esteem and well-being of breast cancer survivors. *Journal of Advanced Nursing* 29(6), 1402–1411. doi:10.1046/j.1365-2648.1999.01027.x
- Chen F, Ma LY, Zhao C, *et al.* (2022) Quality of life assessment in patients with breast cancer receiving radiation therapy: A prospective study. *International Journal of Radiation Oncology, Biology, Physics* 114(3), e457. doi:10.1016/j.ijrobp.2022.07.1694
- Cordova MJ, Riba MB and Spiegel D (2017) Post-traumatic stress disorder and cancer. *The Lancet Psychiatry* 4(4), 330–338. doi:10.1016/S2215-0366(17)30014-7
- Culbertson MG, Bennett K, Kelly CM *et al.* (2020) The psychosocial determinants of quality of life in breast cancer survivors: A scoping review. *BMC Cancer* 20(1), 1–36. doi:10.1186/s12885-020-07389-w
- Di Matteo MR and Martin LR (2002) *Health Psychology*. Boston: Person Education.
- Elder EE, Brandberg Y, Björklund T, *et al.* (2005) Quality of life and patient satisfaction in breast cancer patients after immediate breast reconstruction: A prospective study. *The Breast* 14(3), 201–208. doi:10.1016/j.breast.2004.10.008
- Fortin J, Leblanc M, Elgbeili G, *et al.* (2021) The mental health impacts of receiving a breast cancer diagnosis: A meta-analysis. *British Journal of Cancer* 125(11), 1582–1592. doi:10.1038/s41416-021-01542-3
- Galanou C, Galanakis M, Alexopoulos E, *et al.* (2014) Rosenberg self-esteem scale Greek validation on student sample. *Psychology* 5(08), 819. doi:10.4236/psych.2014.58093
- Giaquinto AN, Sung H, Miller KD, *et al.* (2022) Breast cancer statistics, 2022. CA: A Cancer Journal for Clinicians 72(6), 524–541. doi:10.3322/caac.21754
- Gomes NS and Silva SRD (2013) Evaluation of the self-esteem of women who had undergone breast cancer surgery. *Texto & Contexto-Enfermagem* 22, 509–516. doi:10.1590/S0104-07072013000200029
- Heimes AS, Stewen K and Hasenburg A (2017) Psychosocial aspects of immediate versus delayed breast reconstruction. *Breast Care* 12(6), 374–377. doi:10.1159/000485234
- Helms RL, O'Hea EL and Corso M (2008) Body image issues in women with breast cancer. *Psychol Health Med*. 13(3), 313–325. doi:10.1080/13548500701405509
- Hill J, Holcombe C, Clark L, *et al.* (2011) Predictors of onset of depression and anxiety in the year after diagnosis of breast cancer. *Psychological Medicine* 41(7), 1429–1436. doi:10.1017/S0033291710001868
- Kornblith AB and Ligibel J (2003) Psychosocial and sexual functioning of survivors of breast cancer. *Seminars in Oncology* 30(6), 799–813. doi:10.1053/j.seminoncol.2003.08.025
- Li J, Santa-Maria CA, Feng H, *et al.* (2020) Patient-reported outcomes of breast cancer patients during the COVID-19 outbreak in the epicenter of China: A cross-sectional survey study. *Clinical Cancer Research* 26(18 Suppl), 2020. doi:10.1158/1557-3265.COVID-19-S07-02
- LoConte NK, Else-Quest NM, Eickhoff J, *et al.* (2008) Assessment of guilt and shame in patients with non-small-cell lung cancer compared with patients with breast and prostate cancer. *Clinical Lung Cancer* 9(3), 171–178. doi:10.3816/CLC.2008.n.026
- Louvardi M, Pelekasis P, Chrousos GP, *et al.* (2020) Mental health in chronic disease patients during the COVID-19 quarantine in Greece. *Palliative & Supportive Care* 18(4), 394–399. doi:10.1017/S147895152000528
- Maneesriwongul W and Dixon JK (2004) Instrument translation process: A methods review. *Journal of Advanced Nursing* 48(2), 175–186. doi:10.1111/j.1365-2648.2004.03185.x
- Marschall D, Sanftner J and Tangney JP (1994) *The State Shame and Guilt Scale*. Fairfax, VA: George Mason University.
- Memorial Sloan Cancer Center (2017) Breast-Q Version 2.0. USA: The University of British Columbia.

- Oh PJ and Cho JR** (2020) Changes in fatigue, psychological distress, and quality of life after chemotherapy in women with breast cancer: A prospective study. *Cancer Nursing* **43**(1), E54–E60. doi:10.1097/NCC.0000000000000689
- Palesh O, Butler LD, Koopman C, et al.** (2007) Stress history and breast cancer recurrence. *Journal of Psychosomatic Research* **63**(3), 233–239. doi:10.1016/j.jpsychores.2007.05.012
- Parikh D, Ieso PD, Garvey G, et al.** (2015) Post-traumatic stress disorder and post-traumatic growth in breast cancer patients – A systematic review. *Asian Pacific Journal of Cancer Prevention* **16**(2), 641–646. doi:10.7314/APJCP.2015.16.2.641
- Pelekasis P, Zisi G, Koumariou A, et al.** (2016) Forming a stress management and health promotion program for women undergoing chemotherapy for breast cancer: A pilot randomized controlled trial. *Integrative Cancer Therapies* **15**(2), 165–174. doi:10.1177/1534735415598225
- Retrouvey H, Solaja O, Gagliardi AR, et al.** (2019) Barriers of access to breast reconstruction: A systematic review. *Plastic and Reconstructive Surgery* **143**(3), 465e–476e. doi:10.1097/PRS.0000000000005313
- Robson C** (2002) *Real World Research: A Resource for Social Scientists and Practitioner-Researchers*, 2nd edn. Malden, MA: Blackwell.
- Rosenberg M** (1965) Rosenberg Self-Esteem Scale (RSE) Acceptance and commitment therapy. *Measures Package* **61**(52), 18 doi:10.1037/t01038-000.
- Schmidt ME, Wiskemann J and Steindorf K** (2018) Quality of life, problems, and needs of disease-free breast cancer survivors 5 years after diagnosis. *Quality of Life Research* **27**(8), 2077–2086. doi:10.1007/s11136-018-1866-8
- Shaver KG and Drown D** (1986) On causality, responsibility, and self-blame: A theoretical note. *Journal of Personality and Social Psychology* **50**(4), 697. doi:10.1037/0022-3514.50.4.697
- Sheppard LA and Ely S** (2008) Breast cancer and sexuality. *Breast J* **14**(2), 176–181. doi:10.1111/j.1524-4741.2007.00550.x
- Solikhah S, Matahari R, Utami FP, et al.** (2020) Breast cancer stigma among Indonesian women: A case study of breast cancer patients. *BMC Women's Health* **20**(1), 1–5. doi:10.1186/s12905-020-00983-x
- Soon PS, Ruban S, Mo HTJ, et al.** (2019) Understanding patient choices regarding breast reconstruction after mastectomy for breast cancer. *Supportive Care in Cancer* **27**(6), 2135–2142. doi:10.1007/s00520-018-4470-0
- Tarkowska M, Głowacka-Mrotek I, Nowikiewicz T, et al.** (2020) Sexual functioning and self-esteem in women after mastectomy – A single-centre, non-randomised, cross-sectional study. *Contemporary Oncology/Współczesna Onkologia* **24**(2), 106–111. doi:10.5114/wo.2020.95876
- Youn HJ and Han W** (2020) A review of the epidemiology of breast cancer in Asia: Focus on risk factors. *Asian Pacific Journal of Cancer Prevention: APJCP* **21**(4), 867. doi:10.31557/APJCP.2020.21.4.867
- Zielonke N, Gini A, Jansen EE, et al.** (2020) Evidence for reducing cancer-specific mortality due to screening for breast cancer in Europe: A systematic review. *European Journal of Cancer* **127**, 191–206. doi:10.1016/j.ejca.2019.12.010