



The Relationship Between Body Image and Meaning of Life Among Women with Breast Cancer in Kerman, Iran.

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ABSTRACT

We aimed to examine the relationship between body image and the meaning of life among women with breast cancer. The analytic sample included 142 women with breast cancer, and data were collected using a standardized questionnaire through face-to-face interviews. We used Kolmogorov–Smirnov test, Pearson test, Spearman and Mann–Whitney U test to determine the relationship between the research variables. We found an association between the mean score of body image and the mean score of the meaning of life. As the average score of body image increases, the score of the meaning of life increases ($p < 0.05$). Findings indicated that the body image score increases by increasing the score of the meaning of life and its dimensions, especially existential vacuum and acceptance of death. Future research and targeted treatments should consider the role of body image in shaping the meaning of life among women with breast cancer.

KEYWORDS: Breast cancer; body image; meaning of life; Iran.

Introduction

Breast cancer is the most commonly known type of cancer in women worldwide, and the number of cancer patients was estimated to increase from 1.6 million in 2000 to nearly 3 million in 2050 [1]. In Iran, breast cancer is one of the most common malignancies in women and imposes enormous costs on the national healthcare system. The incidence, morbidity, and mortality of breast cancer in Iran are estimated to be 28.3 and 4.33 per 100,000 women, respectively [2]. However, inadequate access to health services in low-income countries, including Iran, delays the diagnosis and disrupts breast cancer treatment [3]. In addition to the difficulties of accessing early diagnosis, treatments, such as surgery, chemotherapy, radiotherapy, and hormone therapy often lead to severe changes in the breast cancer survivors' appearance, including breast asymmetry, changes in skin texture, and sensitivities [4]. Moreover, breast cancer treatment causes physical damage, changes in self-perception and attitudes, and, in general, destroys the concept that a woman has of herself [5,6]. Body image, defined as a multifaceted structure that refers to how one experiences the perception of one's body, is a psychological factor and an essential component of quality of life in women with breast cancer [7–9]. Negative body image perceptions are often associated with additional sexual problems caused by impaired body image and can ultimately affect emotional relationships and deprive an individual's emotional support [10]. As the consequences of treatment are directly related to the patient's daily life and social functioning, a growing body of evidence highlighted the importance of body image in breast cancer patients [11]. For example, perceived disorders in social interactions include decreased social activity due to breast cancer treatment and concerns about related psychological and physical symptoms resulting from the feeling of embarrassment and limited social activities in these patients [12]. Moreover, persons who have negative thoughts about their appearance may avoid standing in front of a mirror or interacting with others. This may provide relief in the short term, but the person may give up their values of having intimate relationships with others in the long run. Consequently, the psychological inflexibility caused by impaired body image causes the individuals to live alone and be constantly involved in their inner world [13]. In response to these negative experiences, the person may adopt



a strict approach and lose their connection with meaningful experiences [14]. For instance, a person might stop exercising, refuse to look in the mirror, or distance themselves from intimacy with their partner [15]. Common treatment strategies for body image disorders include reducing psychological inflexibility and enhancing meaningful activities to increase acceptance of cognitive and emotional experiences and reduce hateful body experiences [16]. Generally, it has been shown that having the meaning of life is vital for human life, and its absence leads to a feeling of threat and impedes security recovery [17]. Therefore, the meaning of life may play an essential role in helping individuals with cancer to recognize and reinterpret selfknowledge information and be aware of their health status and their understanding of life, leading to the positive emotions that the patient needs in difficult situations [18]. For example, evidence suggested that people with a higher level of meaning in life have more self-acceptance, greater life satisfaction, more responsibilities, and more self-control [19]. Additionally, body image and the meaning of life have been shown to be associated with individual factors, such as age, disease duration, and quality of life [19]. Given people's views on the meaning of life and the cultural dimension of body image from the perspective of breast patients, body image in women with breast cancer can play a significant role in their recovery. Understanding the relationship between the meaning of life and body image among women with breast cancer can provide solutions to improve their quality of life in these patients. While a previous study examined the association between adult self-image and social/emotional well-being and job-related problems in young testicular cancer survivors [20], the association between body image and the meaning of life in women with breast cancer remains unexplored. Therefore, this study aimed to examine the relationship between body image and the meaning of life among women with breast cancer in Iran in 2020.

Methods:

Study design and setting

This study was a cross-sectional study conducted on women with breast cancer who were referred to medical centers in Kerman, Iran. The inclusion criteria were having minimum literacy to complete the questionnaire, sufficient physical and mental ability to participate in the study, and being 18 years of age at the time of the interview.

Data collection and instrument

Following a similar study and the results of a pilot study on 30 persons, the sample size in this study was estimated as 132 persons using the following formula. Besides, taking a 5% dropout rate into account, the final sample was 142. Furthermore, 30 patients considered a pilot sample were included in the study at the analysis time.

$$n = \frac{z_{1-\frac{\alpha}{2}}^2 + z_{1-\beta}^2}{\omega^2} + 3 = \frac{1.65^2 + 0.83^2}{0.22^2} + 3 \cong 132$$

The data were collected using a standardized questionnaire and completed through face-to-face interviews. The study questionnaire was in Farsi and consisted of the demographic information questionnaire, the meaning of life questionnaire, and the body image questionnaire. The demographic information questionnaire assessed the patients' age, marital status, economic situation, occupation, education, stage of the disease, and the time since the diagnosis. The body image questionnaire was developed by Hopwood et al. [21] to examine body image, and Cordero et al. [22] used this questionnaire among women with breast cancer. The body image questionnaire contains six subscales (12 items). These subscales include self-satisfaction (two items with a score ranging from 0 to 6), satisfaction with naked appearance (three items with a score ranging from 0 to 9), loss of femininity (two items with a score ranging from 0 to 6), sexual attractiveness (three items with a score ranging from 0 to 9), imperfection (one item with a score ranging from 0 to 3), and satisfaction with the wound site (one item with a score ranging from 0 to 3). Each item of subscales is scored on a 4-point Likert scale (basically, very little, very much, and completely). Items 1, 2, 7, and 8 are scored inversely. The minimum score in this questionnaire is zero, and the maximum score is 36. A higher score indicates a favorable body image and vice versa. The third questionnaire used in this study was the attitude toward life (LAP-R), which assesses the meaning of life. The scale has 47 items that are divided into six subscales: 1)

Purpose of life (11 items with a score ranging from 0 to 66) that assesses life goals, having a mission in life, and a sense of direction in one's life; 2) Continuity (five items with a score ranging from 0 to 30) that measures the degree of having a consistent understanding of self, others, and life; 3) Choice/ Responsibility (five items with a score ranging from 0 to 30) that assesses a person's perception of having personal agency in directing one's life; 4) Death Acceptance (six items with a score ranging from 0 to 36) measures the degree to which a person has achieved death transcendence; 5) Existential Vacuum (nine items with a score ranging from 0 to 54) that determines if a person has a lack of meaning, goals, and direction in life, and 6) Goal Seeking (six items with a score ranging from 0 to 36) that determines the person's search for new and different experiences and an eagerness to get more out of life.

Statistical analysis

Descriptive statistics, including mean and standard deviation were calculated and used to summarize the data. Since the data did not follow a normal distribution, Kolmogorov–Smirnov (KS) test ($p < 0.05$), Pearson test, Spearman and Mann–Whitney U test, and Kruskal–Wallis test were used to determine the relationship between the research variables. Data analysis was performed using SPSS version 22 software (SPSS Inc., Chicago, IL).

Ethical considerations

Participants were invited to attend a briefing session, and the research protocol was fully explained to them. Participants were informed that their participation in the study was voluntary. Before taking the interviews, verbal consent was obtained from the participants. The study protocol was approved by the ethics committee of the Kerman University of Medical Sciences.

Results

Participants characteristics

The mean age (SD) of the women participating in the study was 49.59 (10.57) years. The mean duration of the disease (SD) in these women was 8.24 (10.61) years. Most women were married (97.2%) and more than half of them (55.6%) had high school and diploma education. A majority of the participants were unemployed (61%). Moreover, 70.7% of them reported that they had a moderate economic status, and 58.9% of them were treated with mastectomy (Table 1).

Table 1. Sociodemographic characteristics of women with breast cancer by body image and meaning of life in Kerman, Iran in 2020

Variables	Minimum			Maximum			Mean \pm SD		
Age, year	28			70			49.59 \pm 10.57		
Duration of illness, month	21			84			8.24 \pm 10.61		
	Body image			Meaning of life					
	N (%)	Mean \pm SD	p Value	N (%)	Mean \pm SD	p Value			
Marital status			0.31*			0.23*			
Single	1 (0.7)	13 \pm 0		1 (0.7)	82 \pm 0				
Married	138 (97.2)	12.2 \pm 5.51		138 (97.2)	107.92 \pm 35.4				
Widow	3 (2.1)	14.66 \pm 4.16		3 (2.1)	134.33 \pm 42.6				
Grade			0.26**			0.11*			
Literacy for reading and writing	29 (20.4)	13.65 \pm 4.44		29 (20.4)	102.65 \pm 30.2				
High school and diploma	79 (55.6)	11.8 \pm 5.82		79 (55.6)	107.05 \pm 36.4				
University	34 (23.9)	12.09 \pm 5.24		34 (23.9)	116.46 \pm 37.4				
Job			0.14**			<0.001*			
Unemployed	86 (61)	11.53 \pm 5.51		86 (61)	99.77 \pm 32.7				
Employee	26 (18.4)	12.6 \pm 5.61		26 (18.4)	121.04 \pm 31.1				
Retired	11 (7.8)	14.81 \pm 3.91		11 (7.8)	129.36 \pm 38.9				
Free	16 (12.8)	13.66 \pm 5.25		16 (12.8)	120.05 \pm 31.5				



The economic situation			0.43 [*]			0.04 [*]
Weak	39 (27.9)	12.56 ± 4.83		39 (27.9)	100.35 ± 30.0	
medium	99 (70.7)	11.96 ± 5.69		99 (70.7)	110.16 ± 36.3	
Excellent	2 (1.4)	107.74 ± 18.81		2 (1.4)	173.5 ± 27.5	
Type of treatment			0.76 ^{^^}			0.79 [^]
Partial Mastectomy	51 (36.2)	12.64 ± 5.96		51 (36.2)	107.14 ± 36.1	
Total Mastectomy	83 (58.9)	11.97 ± 5.24		83 (58.9)	108 ± 34.8	
Partial Mastectomy and Total Mastectomy	7 (5)	12.83 ± 3.86		7 (5)	122.33 ± 44.2	

Body image

The mean body image (SD) score in women with cancer was 12.22 (5.44). The patients' body image score was lower than the standard mean rank. The highest mean score in body image dimensions was related to the dimension of loss of femininity (mean \pm SD $\frac{1}{4}$ 3.14 \pm 1.75) and the patient's feelings about sexual attractiveness (mean \pm SD $\frac{1}{4}$ 3.14 \pm 1.75). Understanding the sense of imperfection (mean \pm SD $\frac{1}{4}$ 1.09 \pm 0.74), satisfaction and dissatisfaction of the patient with the clothes without clothes (mean \pm SD $\frac{1}{4}$ 1.38 \pm 0.89), satisfaction and dissatisfaction of the patient in the reaction of others to her body (mean \pm SD $\frac{1}{4}$ 1.62 \pm 1.3), and satisfaction with the wound site (mean \pm SD $\frac{1}{4}$ 2.14 \pm 0.81) had the lowest mean score in body image dimensions (Table 2). Regarding demographic variables, the results showed a significant positive relationship between age and body image ($r^{\frac{1}{4}}$ 0.26; $p < 0.001$). There was also a negative linear relationship between the disease duration and body image ($r^{\frac{1}{4}}$ -0.25; $p^{\frac{1}{4}}$ 0.003) (Table 3).

Table 2. Mean score and standard deviation of body image, and meaning of life, total and by dimensions in women with breast cancer in Kerman, Iran in 2020.

Variable	Minimum	Maximum	Mean	SD
Dimensions of body image				
Body image (total)	1	20	12.22	5.44
Satisfaction and dissatisfaction of the patient with the clothes without clothes	0	4	1.38	0.89
Satisfaction and dissatisfaction of the patient in the reaction of others to her body	0	6	1.62	1.3
Loss of femininity	0	8	3.14	1.75
Patient feelings about her sexual attractiveness	0	8	3.14	1.75
Understand the sense of imperfection	0	3	1.09	0.74
Satisfaction with the wound site	0	3	2.14	0.81
Dimensions of the meaning of life				
The meaning of life (total)	44	213	108.56	35.36
Life goals	3	55	22.69	11.1
Existential vacuum	7	37	18.37	6.8
Accepting death	0	30	3.14	1.75
Target search	0	8	3.14	1.75
Continuity	0	3	1.09	0.74
Choice/responsibility	0	3	2.14	0.81

Meaning of life

The mean meaning of life (SD) score in the women with cancer was 108.56 (35.36) with a range of 44–213. Moreover, life goals (mean \pm SD $\frac{1}{4}$ 22.69 \pm 11.1) and existential vacuum (mean \pm SD $\frac{1}{4}$ 18.37 \pm 6.8) had the highest mean scores in the meaning of life dimensions, followed by accepting death (mean \pm SD $\frac{1}{4}$ 3.14 \pm 1.75), target

search (mean \pm SD $\frac{1}{4}$ 3.14 \pm 1.75), choice/responsibility (mean \pm SD $\frac{1}{4}$ 2.14 \pm 0.81), and continuity (mean \pm SD $\frac{1}{4}$ 1.09 \pm 0.74) (Table 2). With respect to demographic variables, the mean score of the meaning of life in people with higher economic status was higher than other people (mean \pm SD $\frac{1}{4}$ 173.5 \pm 27.5). The mean score of the meaning of life in the retired people was significantly higher compared to people with other occupations (mean \pm SD $\frac{1}{4}$ 129.36 \pm 38.9 (Table 1). Moreover, there was a negative relationship between the disease duration and meaning of life score (r $\frac{1}{4}$ -0.24; p $\frac{1}{4}$ 0.004) (Table 3).

Table 3. Relationship between body image score and meaning of life with quantitative demographic variables in women with breast cancer in Kerman, Iran in 2020.

Variable	Meaning of life	p Value	p Value adjust *
Body image	$r = 0.46$	< 0.001	< 0.001
	Meaning of life	Body image	
	Spearman correlation coefficients	p Value	Pearson correlation coefficients
Age	$r = 0.15$	0.06	$r = 0.26$
Duration of illness	$r = -0.24$	0.004	$r = -0.25$
Meaning of life			
			p Value
			0.001
			0.003

*: r : Spearman correlation coefficient.

Association of body image and meaning of life

The results of the Spearman correlated test showed that there was a significant correlation between the mean score of body image and the mean score of meaning of life, indicating that the participants with a more favorable body image perceived their life to be more meaningful (r $\frac{1}{4}$ 0.46; p $<$ 0.001) (Table 3). With regard to the dimensions, life goals dimension of meaning of life had a positive and significant relationship with the body image dimensions. The highest correlation of life goals was related to satisfaction and dissatisfaction of the patient in clothes and without clothes (r $\frac{1}{4}$ 0.34; p $<$ 0.001) and understanding the sense of imperfection (r $\frac{1}{4}$ 0.34; p $<$ 0.001). The existential vacuum was directly and significantly related to all dimensions of body image, with the highest correlation was related to understanding the sense of imperfection (r $\frac{1}{4}$ 0.31; p $<$ 0.001). The acceptance of death was also positively and significantly related to the body image dimensions, with the highest correlation with satisfaction and dissatisfaction of the patient in the reaction of others to her body (r $\frac{1}{4}$ 0.45; p $<$ 0.001). The target search dimension was directly and significantly related to the body image dimensions and it had the highest correlation with understanding the sense of imperfection (r $\frac{1}{4}$ 0.27; p $<$ 0.001). Continuity as another dimension of meaning of life was also significantly and directly related to body image dimensions and showed the highest correlation with wound satisfaction (r $\frac{1}{4}$ 0.37; p $<$ 0.001). Moreover, choice/responsibility dimension had a significant and direct relationship with all body image dimensions, and showed the highest correlation with satisfaction and dissatisfaction of the patient in clothes and without clothes (r $\frac{1}{4}$ 0.36; p $<$ 0.001) (Table 4).

Table 4. Relationship between body image and meaning of life dimensions in women with breast cancer in Kerman, Iran in 2020.

Variable	Life goal	Existential vacuum	Accepting death	Target search	Continuity	Choice/responsibility
Satisfaction and dissatisfaction of the patient in	clothes and	without clothes	and satisfaction	and dissatisfaction	on the patient	in the reaction of others to



her body	$r=0.3$	$r=0.23$	$r=0.35$	$r=0.23$	$r=0.34$	$r=0.36$
Losing a sense of femininity	$p<0.001$	$p=0.006$	$p<0.001$	$p=0.004$	$p<0.001$	$p<0.001$
Patient feelings about her sexual attractiveness	$r=0.29$	$r=0.26$	$r=0.45$	$r=0.26$	$r=0.25$	$r=0.32$
Understand the sense of imperfection	$p<0.001$	$p=0.001$	$p<0.001$	$p=0.001$	$p<0.001$	$p<0.001$
Satisfaction with the wound site	$r=0.31$	$r=0.25$	$r=0.34$	$r=0.18$	$r=0.34$	$r=0.27$
	$p<0.001$	$p=0.002$	$p<0.001$	$p=0.02$	$p<0.001$	$p=0.001$
	$r=0.31$	$r=0.25$	$r=0.34$	$r=0.18$	$r=0.34$	$r=0.27$
	$p<0.001$	$p=0.002$	$p<0.001$	$p=0.02$	$p<0.001$	$p=0.001$
	$r=0.34$	$r=0.31$	$r=0.35$	$r=0.27$	$r=0.33$	$r=0.29$
	$p<0.001$	$p<0.001$	$p<0.001$	$p=0.001$	$p<0.001$	$p<0.001$
	$r=0.29$	$r=0.28$	$r=0.24$	$r=0.16$	$r=0.37$	$r=0.3$
	$p<0.001$	$p=0.001$	$p=0.002$	$p=0.001$	$p<0.001$	$p<0.001$



Discussion

This study examined the relationship between body image and the meaning of life among women with breast cancer. The results showed a significant relationship between body image and the meaning of life, indicating physical disorders may lead to a sense of meaninglessness. Our findings among women with breast cancer regarding the relationship between body image and the meaning of life are comparable to results of studies in other populations. For example, a study in young testicular cancer survivors showed also a significant relationship between body image and meaning of life. Moreover, the meaning of life was directly related to social and emotional health [20]. The findings demonstrated that the dimensions of meaning of life, including life goals, existential vacuum, accepting death, target search, choice/responsibility, and continuity, consistent with the global literature, are also associated with the dimensions of body image. For example, Ryan and Hoyt indicated that the patients' feeling about sexual attractiveness were associated with social, emotional, and occupational health problems [20]. Another study showed that patients with a lower level of meaning of life had a lower score in terms of evaluation of body appearance and satisfaction with the body, highlighting a positive and significant relationship between meaning of life with satisfaction and evaluation of body appearance [23]. Moreover, Dastghir and Karimi reported a significant relationship between cognitive body image integration, psychological inflexibility of body image, meaning of life, and mindfulness with body dysmorphic disorder [24]. Fonseca et al. also suggested that patients with a higher level of meaning in life were in a better position in terms of body image [25]. These findings underscore the need for women with breast cancer to access and use comprehensive mental health programs that improve their body image and meaning of life dimensions to optimize the health and well-being of women with breast cancer. Our study also suggests that future research should consider the role of body image in shaping the meaning of life among women with breast cancer. We found that marital status, economic status, educational level, occupation, and type of treatment had no significant relationship with body image. However, there was also a significant positive relationship between age and body image. There was also a negative relationship between the disease duration and body image. These findings are consistent with other studies. For instance, Ghaffari et al. reported that the age and time of breast cancer diagnosis had a significant and negative relationship with body image [26]. Guedes et al. also reported no statistically significant relationship between age, income, marital status, education level, but a significant relationship was reported between dissatisfaction with body image and occupation [27]. Furthermore, Wu TY et al. studied the dynamic changes in body image and quality of life among women with breast cancer and showed that age, education, family income, and length of time after chemotherapy (i.e., six months after chemotherapy) had a predictive role in the patients' body image and quality of life [11]. These results of the study supported the findings of this study. Therefore, considering the role of age in shaping body image among women with breast cancer, these results suggest that intervention programs to improve body image among women with breast cancer should consider the age of patients in their planning and implement age-specific approaches. Our findings also support the need to provide targeted interventions for women with breast cancer at their early stage of diagnosis to improve their body image level. This study has several limitations that should be acknowledged and considered when interpreting findings. First, our sampling methods were not probability-based and therefore may not be generalizable. Second, we studied women with breast cancer in an urban setting in one location, and therefore results may not be generalized to other women with breast cancer. Lastly, the study design was cross-sectional, reducing the ability to infer the causality of the associations reported here.



Conclusion

The results suggested a positive and significant relationship between body image and the meaning of life among women with breast cancer. Since breast cancer has a high prevalence and women's mood is more vulnerable and sensitive, there is a possibility of some psychological consequences in the diagnosis and treatment of cancer, as well as side effects of various treatments in the breast cancer patients can affect their appearance and body image. There is a need for further research on the consequences of breast cancer on different aspects of patients' life, and multi-level interventions are needed to increase body image and meaning of life among women with breast cancer. These interventions should include increasing body image perception and providing culturally competent mental healthcare for patients with breast cancer.

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Declaration of interest

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References

1. Fitzmaurice C, Allen C, Barber RM, Barregard L, Bhutta ZA, Brenner H, et al. Global, regional, and national cancer incidence, mortality, years of life lost, years lived with disability, and disability-adjusted life- years for 32 cancer groups, 1990 to 2015: a systematic analysis for the global burden of disease study. *JAMA Oncol.* 2017;3(4):524–548. doi:10.1001/jamaoncol.2016.5688.
2. Salehiniya H, Haghighat S, Parsaeian M, Majdzadeh R, Mansournia M, Nedjat S. Iranian breast cancer risk assessment study (IRBCRAS): a case control study protocol. *WCRJ.* 2018;5:1–5. Available from: <https://www.wcrj.net/wp-content/uploads/sites/5/2018/03/e1016-Iranian-breast-cancer-risk-assessment-study.pdf>.
3. Cecilio AP, Takakura ET, Jumes JJ, Dos Santos JW, Herrera AC, Victorino VJ, et al. Breast cancer in Brazil: epidemiology and treatment challenges. *Breast Cancer (Dove Med Press).* 2015;7:43–49. doi:10.2147/BCTT.S50361.
4. Chua AS, DeSantis SM, Teo I, Fingeret MC. Body image investment in breast cancer patients under- going reconstruction: taking a closer look at the appearance schemas inventory-revised. *Body Image.* 2015;13:33–37. doi:10.1016/j.bodyim.2014.12.003.
5. Safabakhsh M, Imani H, Shab-Bidar S. Higher dietary total antioxidant capacity is not associated with risk of breast cancer in Iranian women. *Breast Cancer.* 2020;27(4):652–661. doi:10.1007/s12282-020-01059-2.
6. Bagheri M, Mazaheri M. Body image and quality of life in female patients with breast cancer and healthy women. *J Midwif Reprod Health.* 2015;3(1):285–292. doi:10.22038/JMRH.2015.3584.



7. Zarei A, Poursharifi H, Babapour J. The role of body image dissatisfaction and mental health in prediction of adolescent obesity among girls. *Iran J Endocrinol Metab.* 2016;18(3):197–204. Available from: <https://www.cabidigitallibrary.org/>.
 8. Mebarak Chams M, Tinoco L, Mejia-Rodriguez D, Martinez-Banfi ML, Preuss H, Hammerle F, et al. The Spanish body image state scale: factor structure, reliability and validity in a Colombian population. *Front Psychol.* 2019;10:2553. doi:10.3389/fpsyg.2019.02553.
 9. Khalatbari J, Hemmati Sabet V, Mohammadi H. Effect of compassion-focused therapy on body image and marital satisfaction in women with breast cancer. *Iran Q J Breast Dis.* 2018;11(42):8–20. Available from: <https://www.sid.ir/paper/144587/en>.
 10. Prates ACL, Freitas-Junior R, Prates MFO, Veloso MF, Barros NM. Influence of body image in women undergoing treatment for breast cancer. *Rev Bras Ginecol Obstet.* 2017;39(4):175–183. doi:10.1055/s-0037-1601453.
 11. Wu TY, Chang TW, Chang SM, Lin YY, Wang JD, Kuo YL. Dynamic changes of body image and quality of life in breast cancer patients. *Cancer Manag Res.* 2019;11:10563–10571. doi:10.2147/CMAR.S223314.
 12. Jaafari B, Hashemifard T, Mehri A. The effect of combined decongestive therapy and pneumatic compression pump on body image in women with breast cancer related lymphedema. *Iran J Cancer Care.* 2019; 1(2):39–46. doi:10.29252/ijca.1.2.39.
- Callaghan GM, Sandoz EK, Darrow SM, Feeney TK. The body image psychological inflexibility scale: development and psychometric properties. *Psychiatry Res.* 2015;226(1):45–52. doi:10.1016/j.psychres.2014.11.039.
13. Hooper N, Saunders J, McHugh L. The derived generalization of thought suppression. *Learn Behav.* 2010; 38(2):160–168. doi:10.3758/LB.38.2.160.
 14. Hayes SC, Strosahl KD, Wilson KG. Acceptance and commitment therapy: the process and practice of mindful change. New York, NY: Guilford Press; 2011.
 15. Pearson A, Macera MH, Follette V. Acceptance and commitment therapy for body image dissatisfaction: a practitioner's guide to using mindfulness, acceptance, and values-based behavior change strategies. Oakland, CA: New Harbinger Publications; 2010.
 16. Abu-Raiya H, Sasson T, Russo-Netzer P. Presence of meaning, search for meaning, religiousness, satisfaction with life and depressive symptoms among a diverse Israeli sample. *Int J Psychol.* 2021;56(2):276–285. doi:10.1002/ijop.12709.
 17. Hopman P, Rijken M. Illness perceptions of cancer patients: relationships with illness characteristics and coping. *Psychooncology.* 2015;24(1):11–18. doi:10.1002/pon.3591.
 18. Jafari F, Farahbakhsh K, Shafiabadi A, Delavar A. Quality of life and menopause: developing a theoretical model based on meaning in life, self-efficacy beliefs, and body image. *Aging Ment Health.* 2011; 15(5):630–637. doi:10.1080/13607863.2010.548056.
 19. Ryan SJ, Hoyt MA. Adult self-image and well-being after testicular cancer: the role of agency and meaning. *Psychol Health.* 2018;33(8):1049–1061. doi:10.1080/08870446.2018.1456659.



20. Hopwood P, Fletcher I, Lee A, Al Ghazal S. A body image scale for use with cancer patients. *Eur J Cancer*. 2001;37(2):189–197. doi:[10.1016/s0959-8049\(00\)00353-1](https://doi.org/10.1016/s0959-8049(00)00353-1).
21. Cordero MJA, Villar NM, Sanchez MN, Pimentel- Ramirez ML, Garcia-Rillo A, Valverde EG. Breast cancer and body image as a prognostic factor of depression: a case study in Mexico City. *Nutric Hosp*. 2015; 31(1):371–379.
22. Marco JH, Canabate M, Perez S, Llorca G. Associations among meaning in life, body image, psychopathology, and suicide ideation in Spanish participants with eating disorders. *J Clin Psychol*. 2017; 73(12):1768–1781. doi:[10.1002/jclp.22481](https://doi.org/10.1002/jclp.22481).
23. Dastghir S, Karimi J. The relationship between body Image cognitive fusion, body image psychological inflexibility, meaning in life and mindfulness with body dysmorphic disorder in female Students. *Razi J Med Sci*. 2019;26(6):1–12.
24. Fonseca S, Lencastre L, Guerra M. A satisfação com a vida em mulheres com Cancro da Mama. *Paideia (Ribeirão Preto)*. 2014;24(59):295–303. doi:[10.1590/1982-43272459201403](https://doi.org/10.1590/1982-43272459201403).
25. Ghaffari F, Ghahramanian A, Zamanzadeh V, Onyeka TC, Davoodi A, Mazaheri E, et al. Patient-centred communication for women with breast cancer: relation to body image perception. *J Clin Nurs*. 2020; 29(23–24):4674–4684. doi:[10.1111/jocn.15508](https://doi.org/10.1111/jocn.15508).
26. Guedes TSR, Dantas de Oliveira NP, Holanda AM, Reis MA, Silva CP, Rocha e Silva BL, et al. Body image of women submitted to breast cancer treatment. *Asian Pacific J Cancer Prevent*. 2018;19(6): 1487–1493. doi:[10.22034/APJCP.2018.19.6.1487](https://doi.org/10.22034/APJCP.2018.19.6.1487).
27. Guedes TSR, Dantas de Oliveira NP, Holanda AM, Reis MA, Silva CP, Rocha e Silva BL, et al. Body image of women submitted to breast cancer treatment. *Asian Pacific J Cancer Prevent*. 2018;19(6): 1487–1493. doi:[10.22034/APJCP.2018.19.6.1487](https://doi.org/10.22034/APJCP.2018.19.6.1487).