

Research Paper

Mediating Role of Cognitive Emotion Regulation Strategies in the Relationship Between Anxiety and Body Image in Women With Breast Cancer Volunteered for Mastectomy



Rohollah Zali¹, Ali Esmacili^{2*}, Haydeh Saberi³

1. Department of General Psychology, Faculty of Psychology, Science and Research Branch, Islamic Azad University, Tehran, Iran.
2. Department of Sport Psychology, Faculty of Psychology and Education, Allameh Tabataba'i University, Tehran, Iran.
3. Department of General Psychology, Faculty of Psychology, Rudehen Branch, Islamic Azad University, Tehran, Iran.



Citation Zali R, Esmacili A, Saberi H. Mediating Role of Cognitive Emotion Regulation Strategies in the Relationship Between Anxiety and Body Image in Women With Breast Cancer Volunteered for Mastectomy. *Journal of Research & Health*. 2022; 12(2):85-94. <http://dx.doi.org/10.32598/JRH.12.2.1935.1>

doi <http://dx.doi.org/10.32598/JRH.12.2.1935.1>



Article info:

Received: 23 Aug 2021

Accepted: 01 Feb 2022

Publish: 01 Mar 2022

Keywords:

Breast cancer, Anxiety, Body image, Cognitive emotion regulation

ABSTRACT

Background: The loss of breast is a major concern for women with breast cancer volunteer for mastectomy, because they feel that their feminine identity is at risk of damage. The present study aims to investigate the mediating role of Cognitive Emotion Regulation (CER) in the relationship between anxiety and body image in women with breast cancer volunteered for mastectomy.

Methods: This is a correlational study. The study population consists of all women with breast cancer volunteered for mastectomy referred to Imam Khomeini and Imam Hossein hospitals in Tehran, Iran. Of these, 350 volunteers were selected by a convenience sampling method. The instruments were Beck Anxiety Inventory, Body Image and Relationship Scale of Hormes et al., and Cognitive Emotion Regulation Questionnaire of Garnefski et al. Structural equation modeling was used to analyze the research hypotheses.

Results: Anxiety had a positive effect on maladaptive CER strategies ($\beta=0.654$) and a negative effect on body image ($\beta=-0.574$) ($P<0.001$). The direct effect of maladaptive CER strategies on body image was positive and significant ($\beta=0.271$, $P<0.05$). The direct effects of anxiety on adaptive CER strategies ($\beta=-0.836$) and body image ($\beta=-0.849$) were negative and significant ($P<0.001$). The direct effect of adaptive CER strategies on body image was negative and significant ($\beta=-0.266$, $P<0.001$).

Conclusion: Women undergoing mastectomy will experience more anxiety and negative body image if they use maladaptive CER strategies, while those who use adaptive CER strategies will experience less anxiety and negative body image.

* Corresponding Author:

Ali Esmacili, PhD.

Address: Department of Sport Psychology, Faculty of Psychology and Education, Allameh Tabataba'i University, Tehran, Iran.

Phone: +98 (912) 3245181

E-mail: ali.esmaeili@atu.ac.ir

1. Introduction

The increasing prevalence of cancer in Iran in recent years has led to the recognition of cancer as the major health problem [1]. Unhealthy lifestyles, including smoking, unhealthy diet, sedentary behaviors, as well as changes in the reproductive system, have been shown to intensify the risk of cancer [2]. Breast cancer accounts for 25.5% of all cancers [3] and, according to the World Health Organization, 1.1 million patients with breast cancer are diagnosed each year worldwide [4]. According to the 2020 cancer report published by the World Health Organization, breast cancer is still the second leading cause of death in the world with an incidence rate of 11.6% and mortality rate of 6.6%, which is more common in developing countries in the Middle East [5]. In Iran, according to the latest national report in 2015, breast cancer is the most common type of cancer in women, and its prevalence is 32.9 per 100,000 people, which is higher in Tehran province [6, 7].

What is more worrying is that the patients with breast cancer in Iran are younger than those in western countries [8], and it is the fourth disease with the highest burden among women [9]. However, patients with breast cancer have a longer survival after diagnosis than other cancer cases [10], which requires paying psychological attention to improve the quality of life of these patients. Meanwhile, women undergoing mastectomy surgery experience a lot of psychological distress due to concerns about body image. It has been found that the treatment of breast cancer by mastectomy is significantly related to negative body image, and the results confirm its long-term effects on the quality of life, sexual attractiveness, and psychological adjustment after surgery [11]. Body image is defined as one's perceptions about physical appearance, but for women it is related to wholeness, and it has been found that women who consider body image as a major factor for their self-esteem, attractiveness and wholeness, have poor psychological adjustment after breast cancer treatment [12].

Breast cancer alters psychological and physical symptoms and femininity in affected women [13]. In this regard, studies have reported different prevalence rates of psychiatric disorders in patients with breast cancer. For example, Grabsch et al. [14] reported the prevalence of psychiatric disorders in women with breast cancer as 42%, and stated that 35% of them suffered from depressive disorder, anxiety or both. Burgess et al. [15] state that 50% of women with breast cancer had symptoms of depressive disorder, anxiety, or both at the time of di-

agnosis. Grabsch et al. [14], reported the prevalence rate of anxiety symptoms as 32-45% over a 6-month period after the diagnosis of breast cancer. Refaei Saedi et al. [16] in review study estimated the prevalence of moderate to severe anxiety in women with breast cancer as 16%-65%.

Body image problems in women with mastectomy are affected by age. Young women who attach great importance to their body image, have less satisfaction with body image and poorer psychological adjustment after surgery compared to older women. The variable that can play a mediating role is emotion regulation, which is the process through which a person evoke, maintain, control or change own emotions [17]. According to Gross and Thompson's emotion regulation model, cognitive emotion regulation strategies can play a role in psychiatric disorders. Various studies have proven its role in depression [18-20], generalized anxiety disorder [21], bipolar disorder [22], eating disorders [23], and social anxiety [24], suicidal ideation [25], marital satisfaction [26], post-traumatic stress disorder [27], autism spectrum disorder [28], substance abuse [28, 29], impulsivity [30], attention deficit/hyperactivity disorder [31] and borderline personality disorder [32, 33].

Considering that the prevalence of anxiety and stress in women with breast cancer volunteer for mastectomy is increasingly high, and given that a woman with mastectomy finds herself physically and mentally damaged, and due to the relatively high prevalence of breast cancer in Iran (which imposes a great financial burden on the country's health system) and the importance of Cognitive Emotion Regulation (CER) strategies for its mediation, it seems necessary to know the psychological factors related to breast cancer and its mediating variables. Therefore, this study aims to investigate the mediating role of CER in the relationship between anxiety with body image of women with breast cancer volunteer for mastectomy. This study can help therapists and health policymakers be able to reduce anxiety and concerns about body image in these women by using mediating variables (i.e. CER strategies). Figure 1 depicts the conceptual model of the current study.

2. Methods

This is a correlational study using Structural Equation Modeling (SEM). The study population consists of all women with breast cancer volunteered for mastectomy at Imam Hossein and Imam Khomeini hospitals in 2020-2021. The sampling was done using a convenience sampling method. In this regard, 350 volunteers were select-

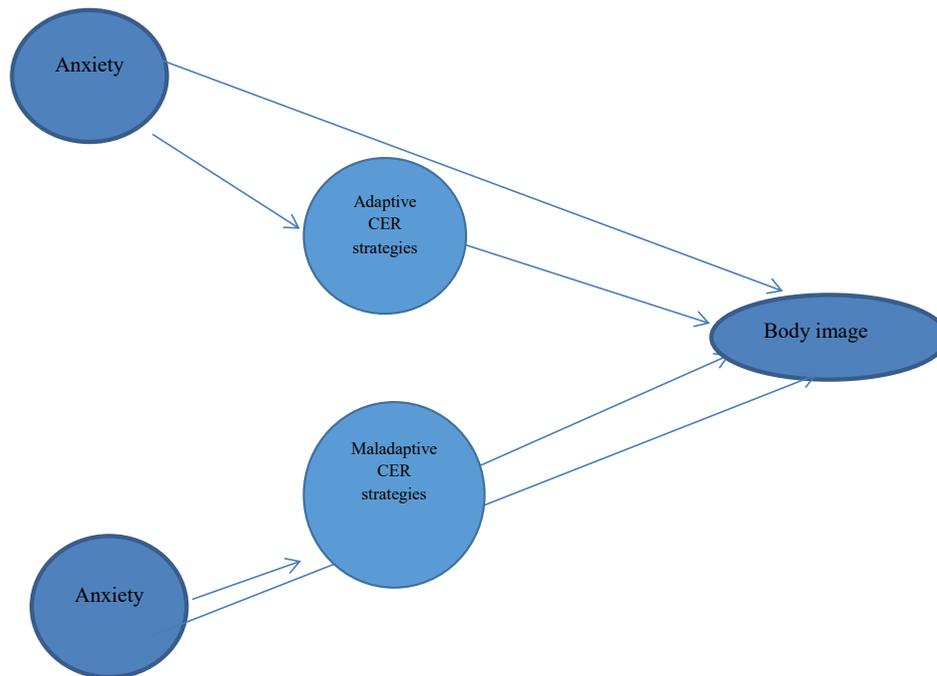


Figure 1. The conceptual model of the current study



ed based on the recommendations of Halinsky & Floret and Miller & Kans [34]. Descriptive statistics, including frequency, were used to describe the data. The SEM (combination of path analysis and confirmatory factor analysis) was used to analyze the research hypotheses. The used instruments were:

Beck Anxiety Inventory (BAI): Developed by Beck et al. [35], it is a 21-item tool that measures the severity of anxiety in adolescents and adults. A score of 1-7 indicates normal anxiety, a score of 8-15 suggests mild anxiety, a score of 16-25 shows moderate anxiety, and a score of 26-63 indicates severe anxiety. The items are scored on a 4-point Likert scale [35]. This questionnaire has high reliability. The internal consistency of the questionnaire (Cronbach's alpha) is 0.92, its test-retest reliability over a one-week interval is 0.75, and the correlation of its questions varies from 0.3 to 0.76 [36, 37]. Moreover, its content validity, concurrent validity and factor validity has been confirmed in various studies, which indicates the high validity of this scale for measuring anxiety [38]. The test-retest reliability in our study for the Persian BAI was reported 0.78.

Body Image and Relationship Scale (BIRS): This 32-item questionnaire was developed by Hormes et al. [11] to measure the body image of women with breast cancer. This scale has three subscales of health & strength, social barriers, and appearance & sexuality. Larsson et al. [39] reported the reliability of the scale using Cronbach's al-

pha as 0.96, and its convergent validity reported 0.68. For its Persian version, Izadi et al. [40] reported a reliability using Cronbach's alpha on 73 women with breast cancer as 0.91, and its correlation with Alice Pope's Self-Esteem inventory was reported 0.82 [41]. The test-retest reliability of the Persian BIRS in our study was obtained 0.74.

Cognitive Emotion Regulation Questionnaire (CERQ): This questionnaire was designed by Garnefski et al. [44] to assess an individual's CER strategies. The questionnaire has 18 items and 9 subscales: self-blame, blaming others, acceptance, planning, positive refocusing, rumination, positive reappraisal, putting into perspective, and catastrophizing [42]. For its Persian version, Cronbach's alpha at a range of 0.68-0.82 for the subscales showed good reliability. The correlation coefficient between the subscales also showed a strong internal correlation between them. Furthermore, the correlation between the subscales of CERQ with Beck Depression Inventory indicated its high concurrent validity [43]. The test-retest reliability of the Persian CERQ in our study was reported 0.80.

3. Results

Table 1 presents the demographic characteristics of participants.

Table 2 shows the results of Kolmogorov-Smirnov test used to examine the assumption that the normality of

Table 1. Demographic characteristics of participants

Characteristics	Category	No. (%)
Age (Y)	25-40	84(24.0)
	40-55	198(57.56)
	55-70	68(19.42)
Level of education	Lower than high school or diploma	193(55.14)
	Bachelor's degree	116(33.14)
	Master's degree and higher	41(11.71)
Occupation status	Employed	81(23.14)
	Housewife (retired/unemployed)	269(76.85)
Marital status	Single	78(22.28)
	Married	272(77.71)



data distribution. Since $P > 0.05$, the assumption of normal distribution was confirmed. Therefore, parametric tests can be used [45] (Table 3).

Table 4 shows that the indirect effect of anxiety on the body image (-0.22) mediated by adaptive CER strategies was significant ($P = 0.003$); adaptive CER strategies reduced anxiety in patients who were worry about their body image. The indirect effect of anxiety on the body image (0.18) mediated by maladaptive CER strategies was also significant ($P < 0.05$). Therefore, it can be said that CER strategies play a mediating role in the relationship between anxiety and body image in women with breast cancer volunteer for mastectomy. The maladapt-

tive CER strategies had a moderate effect size and an increasing mediating role.

Table 5 shows that the direct effect of anxiety on body image was negative and significant ($\beta = -0.574$, $P < 0.001$). The direct effect of maladaptive CER strategies on body image was positive and significant ($\beta = 0.271$, $P < 0.05$). In other words, the patients with maladaptive CER strategies experience more anxiety. The direct effects of anxiety on adaptive CER strategies ($\beta = -0.836$) and body image ($\beta = -0.849$) were negative and significant ($P < 0.001$). The direct effect of adaptive CER strategies on body image was negative and significant ($\beta = -0.266$, $P < 0.001$). In

Table 2. Kolmogorov-Smirnov (K-S) test results to examine the normality of data distribution

Variables	K-S	P
Body image	0.855	0.156
Adaptive CER strategies	0.750	0.254
Maladaptive CER strategies	0.790	0.231
Anxiety	0.680	0.217



Table 3. Correlation matrix between anxiety, CER strategies, and body image

Row	Variables	1	2	3	4
1	Anxiety	1			
2	Body image	-0.627**	1		
3	Adaptive CER strategies	-0.836**	0.444**	1	
4	Maladaptive CER strategies	0.654**	-0.457**	-0.650**	1



other words, the patients with adaptive CER strategies experience less anxiety.

4. Discussion

This study aimed to investigate the mediating role of CER strategies in the relationship between anxiety and body image in women with breast cancer volunteered for mastectomy. The results showed that the adaptive strategies (positive effect) and maladaptive strategies (negative effect) has direct or indirect mediating roles. It can be said that breast cancer patients who use maladaptive CER strategies experience more anxiety and negative body image, while those who use adaptive CER strategies experience less anxiety and negative body image [46]. Findings obtained from this study are consistent

with those of previous studies including Sobhani et al. [47], Soltaninejad [48], Dadfarnia et al. [49], Roošta et al. [50], Mahdich et al. [51], Jahangiri et al. [52], Esfahani [53], Sajjadi and Askarizadeh [54], Sayah et al. [55], Mardani and Mehrabi [56], Weindl et al. [57], Liu et al. [58], and McLafferty et al. [59]. Table 3 shows that adaptive CER strategies is negatively correlated with anxiety and positively correlated with body image. Also maladaptive CER strategies is positively correlated with anxiety and negatively correlated with body image.

Sobhani et al. [47] in a study on mastectomy patients reported that adaptive CER strategies can play a unique role in predicting specific aspects of coping challenges, stress, chronic disease, and surgery. As the sense of control decreases in a person, s/he faces more emotional and

Table 4. Bootstrap test results to determine the mediating role of CER strategies in the relationship between anxiety and body image

Independent	Variables		Resampling	Estimation Error	Bootstrap Bound		Effect Size	P
	Mediating	Dependent			Lower Bound	Upper Bound		
Anxiety	Adaptive CER strategies	Body image	2000	0.065	-0.350	-0.100	-0.22	0.003
Anxiety	Maladaptive CER strategies	Body image	2000	0.052	0.136	0.238	0.18	0.032

P<0.01.

**Table 5.** Regression coefficients

Predictor Variables	Criterion Variables	β	B	Standard Error	t	P
Anxiety	Maladaptive CER strategies	0.654	0.335	0.021	16.139	0.010
Maladaptive CER strategies	Body image	0.271	0.155	0.105	4.475	0.025
Anxiety	Body image	-0.574	-0.562	0.054	-10.460	0.010
Anxiety	Adaptive CER strategies	-0.836	-0.528	0.019	-28.418	0.047
Adaptive CER strategies	Body image	0.266	0.412	0.115	3.564	0.028
Anxiety	Body image	-0.849	-0.831	0.073	-11.395	0.031

P<0.001.



psychological problems. Using adaptive CER strategies such as positive reappraisal can increase a person's sense of control over the inner and outer worlds, which in turn reduces emotional problems. CER skills are the most effective individual factor in mental health and increase the sense of control over the inner and outer worlds [46]. The results can be explained by the fact that women with breast cancer volunteered for mastectomy can regulate their emotion by using adaptive CER strategies, including positive reappraisal and positive refocusing. In other words, the person learns how to identify and correct their distortions, to prevent the occurrence of negative emotions, and to exercise more control over their thoughts and emotions. In this way, they can prevent the onset and severity of anxiety.

The mediating role of maladaptive CER strategies can also be explained by the fact that these strategies including self-blame, can cause anxiety by decreasing positive emotions and even increasing negative emotions. Previous studies have shown that excessive use of negative CER strategies such as rumination, catastrophizing, self-blame is associated with high levels of negative emotional reactions such as depression, anxiety; the constant use of these strategies causes intensification and persistence of negative emotions which causes the patients to experience confusion and anxiety instead of responding appropriately to their disease; this anxiety can lead to negative body image especially in women with breast cancer and mastectomy. Another explanation is that the use of adaptive CER strategies causes the patients to look at negative events differently and pay attention to the positive aspects and possible benefits of that event (e.g., mastectomy) in the long run. As a result, they experience less discomfort and tension and can cope with the problems more easily. The use of maladaptive CER strategies causes the person to be anxious instead of responding appropriately to the event, which leads to negative body image.

According to Maroon's description, adaptive CER strategies act as a social support mechanism and play a major role in emotional disorders such as anxiety. Furthermore, it can be stated that cognition, emotion and behavior are fully interact with each other; CER, by controlling attention and cognitive consequences of emotions, changes the function of the cognitive schema system and, consequently, anxiety symptoms in women with breast cancer volunteered for mastectomy.

5. Conclusion

It can be concluded that CER strategies plays a mediating role in the relationship between anxiety and body image in women with breast cancer volunteered for mastectomy. The use of CER strategies can affect their body image concerns and prevent the destruction of their feminine identity, which in turn can affect the outcome of their treatment. The results of this study can help physicians, psychiatrists, psychologists and counselors.

Limitations

The study had a cross-sectional design, which limits a definitive causal conclusion. We used self-report tools which may offer biased estimates. The role of context was not examined in this study; the structure of this research was mostly adjectives.

Recommendations

Further longitudinal studies can help better understand the variables. Use of clinical interview along with questionnaire is also recommended. The environmental variables should be considered in future studies.

Ethical Considerations

Compliance with ethical guidelines

This study has an ethical approval from [Islamic Azad University of Science](#) and Research Branch (Code: IR.IAU.SRB.REC.1399.095).

Funding

This study was extracted from the PhD dissertation of the first author. It was not funded by any organization.

Authors' contributions

Methodology, data collection and data analysis: Rohollah Zali; Writing – original draft and Writing – review & editing: All authors.

Conflict of interest

The authors declared no conflict of interest

Acknowledgments

The authors would like to thank all the participants as well as the university officials for their cooperation in conducting this research.

References

- [1] Maliheh Poorkiani, Maryam Hazrati, Abbas Abbaszadeh, Peyman Jafari, Mohammad Sadeghi, Tahereh Dejbakhsh, et al. [Does a rehabilitation program improve quality of life in breast cancer patients? (Persian)] *Payesh* 2010; 9(1):61-8. <http://payeshjournal.ir/article-1-589-en.html>
- [2] Torre LA, Bray F, Siegel RL, Ferlay J, Lortet-Tieulent J, Jemal A. Global cancer statistics, 2012. CA: A Cancer Journal for Clinicians. 2015; 65(2):87-108. [DOI:10.3322/caac.21262] [PMID]
- [3] Tran TH, Trinh NL, Hoang Y, Nguyen TL, Vu TT. Health-related quality of life among Vietnamese breast cancer women. *Cancer Control: Journal of the Moffitt Cancer Center*. 2019; 26(1):1073274819862787. [DOI:10.1177/1073274819862787] [PMID] [PMCID]
- [4] Bouya S, Koochakzai M, Rafiemanesh H, Balouchi A, Taheri S, Badakhsh M, et al. Health-related quality of life of Iranian breast cancer patients: A metaanalysis and systematic review. *Breast Cancer Research and Treatment*. 2018; 170(2):205-12. [DOI:10.1007/s10549-018-4750-x] [PMID]
- [5] International Cancer Control Partnership. WHO Cancer Country profiles [Internet]. 2020 [Last Updated: 09 March 2020]. Available from: <https://www.iccp-portal.org/news/who-cancer-country-profiles-2020>
- [6] Roshandel G, Ghanbari-Motlagh A, Partovipour E, Salavati F, Hasanpour-Heidari S, Mohammadi G, et al. Cancer incidence in Iran in 2014: results of the Iranian National Population-based Cancer Registry. *Cancer epidemiology*. 2019; 61:50-8. [DOI:10.1016/j.canep.2019.05.009] [PMID]
- [7] Ataollahi MR, Sharifi J, Paknahad MR, Paknahad A. Breast cancer and associated factors: A review. *Journal of Medicine and Life*. 2015;8(Spec Iss 4):6-11. [PMID]
- [8] Adili D, Bahrami Ehsan H, Shahi F, Mirzania M. [Dimensions of quality of life in women with breast cancer under chemotherapy and its relation with demographic characteristics (Persian)]. *Journal of Psychological Sciences*. 2018; 17(67):345-50. <http://psychologicalscience.ir/article-1-128-en.html>
- [9] Mirzaei H, Mostafaei D, Estebarsari F, Sattarzadeh M, Estebarsari K. [The quality of life of breast cancer patients receiving palliative and supportive care (Persian)]. *Iranian Journal of Rehabilitation Research in Nursing*. 2017; 3(2):19-26. <http://ijrn.ir/article-1-293-en.html>
- [10] Allemani C, Weir HK, Carreira H, Harewood R, Spika D, Wang XS, et al. Global surveillance of cancer survival 1995-2009: Analysis of individual data for 25 676 887 patients from 279 population-based registries in 67 countries (CONCORD-2). *The Lancet*. 2015; 385(9972):977-1010. [DOI:10.1016/S0140-6736(14)62038-9]
- [11] Hormes JM, Lytle LA, Gross CR, Ahmed RL, Troxel AB, Schmitz KH. The body image and relationships scale: Development and validation of a measure of body image in female breast cancer survivors. *Journal of Clinical Oncology*. 2008; 26(8):1269-74. [DOI:10.1200/JCO.2007.14.2661] [PMID]
- [12] Carver CS, Pozo-Kaderman C, Price AA, Noriega V, Harris SD, Derhagopian RP, et al. Concern about aspects of body image and adjustment to early-stage breast cancer. *Psychosomatic Medicine*. 1998; 60(2):168-74. [DOI:10.1097/00006842-199803000-00010] [PMID]
- [13] Bakht S, Najafi S. (2010). Body image and sexual dysfunctions: Comparison between breast cancer patients and healthy women. *Procedia Social and Behavioral Sciences*. 2010; 5:1493-7. [DOI:10.1016/j.sbspro.2010.07.314]
- [14] Grabsch B, Clarke DM, Love A, McKenzie DP, Snyder RD, Bloch S, et al. Psychological morbidity and quality of life in women with advanced breast cancer: A cross-sectional survey. *Palliat Support Care*. 2006; 4(1):47-56. [DOI:10.1017/s1478951506060068] [PMID]
- [15] Burgess C, Cornelius V, Love S, Graham J, Richards M, Ramirez A. Depression and anxiety in women with early breast cancer: Five-year observational cohort study. *BMJ*. 2005; 330(7493):702. [DOI:10.1136/bmj.38343.670868.D3] [PMID] [PMCID]
- [16] Gallagher J, Parle M, Cairns D. Appraisal and psychological distress six months after diagnosis of breast cancer. *British Journal of Health Psychology*. 2002; 7(Part 3):365-76. [DOI:10.1348/135910702760213733] [PMID]
- [17] Refaee Saeedi N, Aghamohammadian Sharbaf H, Asghari Ebrahimabad MJ, Kareshki H. Psychological consequences of breast cancer in Iran: A meta-analysis. *Iranian Journal of Public Health*. 2019; 48(5):816-24. [DOI:10.18502/ijph.v48i5.1796] [PMID] [PMCID]
- [18] Pecor MJ. The impact of breast cancer on body image in ethnically diverse women. Auburn University; 2004. <https://www.globethesis.com/?t=1454390008481796>
- [19] Garnefski N, Kraaij V, Spinhoven P. Negative life events, cognitive emotion regulation and emotional problems. *Personality and Individual Differences*. 2001; 30(8):1311-27. [DOI:10.1016/S0191-8869(00)00113-6]
- [20] Gross JJ, Thompson RA. Emotion Regulation: Conceptual Foundations. In: J. Gross (Ed.), *Handbook of Emotion Regulation*; 2007. <https://philpapers.org/rec/GROERC>
- [21] Zhang F, Liu N, Huang C, Kang Y, Zhang B, Sun Z, et al. The relationship between childhood trauma and adult depression: The mediating role of adaptive and maladaptive emotion regulation strategies. *Asian Journal of Psychiatry*. 2020; 48:101911. [DOI:10.1016/j.ajp.2019.101911] [PMID]
- [22] Iacoviello BM, Wu G, Alvarez E, Huryk K, Collins KA, Murrough JW, et al. Cognitive-emotional training as an intervention for major depressive disorder. *Depression and Anxiety*. 2014; 31(8):699-706. [DOI:10.1002/da.22266] [PMID]
- [23] Brockmeyer T, Bents H, Holtforth MG, Pfeiffer N, Herzog W, Friederich HC. Specific emotion regulation impairments in major depression and anorexia nervosa. *Psychiatry Research*. 2012; 200(2-3):550-3. [DOI:10.1016/j.psychres.2012.07.009] [PMID]
- [24] Makovac E, Meeten F, Watson DR, Garfinkel SN, Critchley HD, Ottaviani C. Neurostructural abnormalities associated with axes of emotion dysregulation in generalized anxiety. *NeuroImage. Clinical*. 2015; 10:172-81. [DOI:10.1016/j.nicl.2015.11.022] [PMID] [PMCID]
- [25] Fakhari A, Minashiri A, Khazae S, Movahedi Y, Fallahi A, Taher Panah M. [Study of deficiency in theory of mind and emotion regulation in bipolar disorder and depressed patients compared with normal subjects (Persian)]. *Studies in Medical Sciences*. 2014; 25(6):511-20. <http://umj.umsu.ac.ir/article-1-2367-en.html>

- [26] Nicholls W, Devonport TJ, Blake M. The association between emotions and eating behaviour in an obese population with binge eating disorder. *Obesity Reviews*. 2016; 17(1):30-42. [DOI:10.1111/obr.12329] [PMID]
- [27] Mashhadi A, Ghasempour A, Akbari E, Ilbaygi R, Hassanzadeh S. [The role of anxiety sensitivity and emotion regulation in prediction of social anxiety disorder in students (Persian)]. *Knowledge & Research in Applied Psychology*. 2013; 14(2):89-99. <https://www.sid.ir/en/Journal/ViewPaper.aspx?ID=337523>
- [28] Hasani J, Miraghaie AM. [The relationship between strategies for cognitive regulation of emotions and suicidal ideation (Persian)]. *Contemporary Psychology*. 2012; 7(1):61-72. <https://www.sid.ir/en/Journal/ViewPaper.aspx?ID=293482>
- [29] Riahi F, Golzari M, Mootabi F. [The relationship between emotion regulation and marital satisfaction using the actor-partner interdependence model (Persian)]. *Iranian Journal of Psychiatry and Clinical Psychology*. 2020; 26(1):44-63 [DOI:10.32598/ijpcp.26.1.3038.1]
- [30] Mazloom M, Yaghubi H. [Role of emotion regulation and thought control in prediction of post-traumatic stress disorder (Persian)]. *Journal of Clinical Psychology*. 2016; 8(4):1-0. [DOI:10.22075/JCP.2017.2249]
- [31] Amini M, Shiasy Y, Motallebi Z, Lotfi M. [The role of emotion regulation and Personality traits as predictors of Quality of life and General health in mothers of children with autism spectrum disorders (Persian)]. *Journal of Sabzevar University of Medical Sciences*. 2020; 27(3):424-30. http://jsums.medsab.ac.ir/article_1317.html?lang=en
- [32] Ahmadi G, Sohrabi F, Borjali A. [Effectiveness of emotion regulation training on reappraisal and emotional suppression in soldiers with opioid use disorder (Persian)]. *Counseling Culture and Psychotherapy*. 2018; 9(34):191-209. [DOI:10.22054/QCCPC.2018.33455.1876]
- [33] Behnam B, Abdollahpoor A, Abdollahi M, Mirshoja M, Moradi SH. [Comparison of attachment styles and emotion regulation strategies in addicts and non-addict people (Persian)]. *Journal of Clinical Psychology*. 2016; 7(4):71-80. [DOI:10.22075/JCP.2017.2219]
- [34] Etemadi M, Aghebati A, Ayatmehr F, Ashoori A. Predicting borderline personality traits in adolescents based on parenting styles and emotion regulation strategies. *Practice in Clinical Psychology*. 2020; 8(2):133-42. [DOI:10.32598/jpcp.8.2.656.1]
- [35] Hoseini Omam SS, Najafi M, Makvand Hosseini S, Salavati M, Rezaei AM. [Comparison of the effectiveness of emotion regulation skills training based on Gross Model and Linehan Model on suicidal thoughts in adolescents with borderline personality disorder (Persian)]. *Journal of Psychological Studies*. 2019; 15(1):131-46. [DOI:10.22051/PSY.2018.18804.1562]
- [36] Aazam Y, Sohrabi F, Borjal A, Chopan H. [The effectiveness of teaching emotion regulation based on gross model in reducing impulsivity in drug-dependent people (Persian)]. *Scientific Quarterly of Research on Addiction*. 2014; 8(30):127-41. <http://etiadjohi.ir/article-1-648-fa.html>
- [37] Hooman HA. [Structural equation modeling using LISREL software (Persian)]. Tehran: SAMT Publication; 2009. http://opac.nlai.ir/opac-prod/search/briefListSh.do?command=L_VIEW&cid=206us=1&sortKey1=s_author
- [38] Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*. 1988; 56(6):893-7. [DOI:10.1037/0022-006X.56.6.893] [PMID]
- [39] Kaviani H, Mousavi AS. [Psychometric properties of the Persian version of Beck Anxiety Inventory (BAI) (Persian)]. *Tehran University Medical Journal*. 2008; 66(2):136-40. <http://tumj.tums.ac.ir/article-1-641-en.html>
- [40] Wetherell JL, Gatz M. The beck anxiety inventory in older adults with generalized anxiety disorder. *Journal of Psychopathology and Behavioral Assessment*. 2005; 27(1):17-24. [DOI:10.1007/s10862-005-3261-3]
- [41] Brenner LA. Beck anxiety inventory. In: Kreutzer JS, DeLuca J, Caplan B, editors. *BAI. Encyclopedia of clinical neuropsychology*. New York: Springer; 2010. https://www.google.com/books/edition/Encyclopedia_of_Clinical_Neuropsychology/fVcZSj1NLg4C?hl=en
- [42] Hedin Larsson Y, Speck R, Schmitz KH, Johansson K, Gyllensten AL. The body image and relationship scale: A Swedish translation, cultural adaptation, and reliability and validity testing. *The European Journal of Physiotherapy*. 2014; 16(2):67-75. [DOI:10.3109/21679169.2014.881913]
- [43] Izadi-Ajirlo A, Bahmani B, Ghanbari-Motlagh A. [Effectiveness of cognitive behavioral group intervention on body image improving and increasing self-esteem in women with breast cancer after mastectomy (Persian)]. *Archives of Rehabilitation*. 2013; 13(4):72-83. <http://rehabilitationj.uswr.ac.ir/article-1-925-fa.html>
- [44] Garnefski N, Legerstee J, Kraaij VV, Van Den Kommer T, Teerds J. Cognitive coping strategies and symptoms of depression and anxiety: A comparison between adolescents and adults. *Journal of Adolescence*. 2002;25(6):603-11. [DOI:10.1006/jado.2002.0507] [PMID]
- [45] Hasani J. [The reliability and validity of the short form of the cognitive emotion regulation questionnaire (Persian)]. *Journal of Research in Behavioral Sciences*. 2011; 9(4):229-40. <https://www.sid.ir/en/journal/ViewPaper.aspx?id=242604>
- [46] Sharifi HP, Sharifi N. [The methods of research in behavioral sciences (Persian)]. Tehran : Sokhan publication; 2001. http://opac.nlai.ir/opac-prod/search/briefListSearch.rtf?rtKey=sortkey_title&sortKey=sortkey_author
- [47] Sobhani R, Zebardast A, Rezaei S. [Cognitive emotion regulation strategies, body image, and sexual satisfaction in women with and without a history of hysterectomy and mastectomy surgeries (Persian)]. *Scientific Journal of Nursing, Midwifery and Paramedical Faculty*. 2020; 6(1):72-87. <http://sinmp.muk.ac.ir/article-1-305-fa.html>
- [48] Soltaninejad M. [The relationship of self-differentiation and cognitive emotion regulation with quality of life in women with breast cancer (Persian)]. *Iranian Journal of Breast Diseases*. 2018; 11(1):58-66. <http://ijbd.ir/article-1-644-fa.html>
- [49] Dadfarnia S, Hadianfard H, Rahimi C, Aflakseir A. [Predicting depression based on cognitive emotion regulation strategies (Persian)]. *The Journal of Toloo-e-Behdasht*. 2020; 19 (1) :32-47. [DOI:10.18502/tbj.v19i1.2815]
- [50] Roosta S, Mollazadeh J, Goodarzi M, Aflakseir A. [The prediction of marital adjustment based on cognitive emotion regulation strategies in infertile couples (Persian)]. *Nursing and Midwifery Journal*. 2019; 17(9):716-23. <http://unmf.umsu.ac.ir/article-1-3573-fa.html>

- [51] Mahdieh A, Abdollahi M, Hasani H. [Cognitive emotion regulation strategies in processing suicidal thoughts in the students of Khurazmi University of Karaj (Persian)]. *Journal Of Ilam University of Medical Sciences*. 2014; 22(Supplement):225-35. <https://www.sid.ir/en/journal/ViewPaper.aspx?ID=420466>
- [52] Jahangiri J, Hasani J, Alipour F, Haghani Zemeydani M. [Comparison of cognitive emotion regulation strategies and psychological distress in patients with AIDS and normal individuals (Persian)]. *Journal of Mazandaran University of Medical Sciences*. 2016; 26 (138):187-92. <http://jmums.mazums.ac.ir/article-1-7971-fa.html>
- [53] Esfahani A, Zeinali S, Kiani R. Effect of acceptance and commitment therapy on pain-related anxiety and cognitive emotion regulation in breast cancer patients: A clinical trail. *Journal of Arak University of Medical Sciences*. 2020; 23(2):138-49. <http://jams.arakmu.ac.ir/article-1-6144-en.html>;
- [54] Sajjadi MS, Askarizadeh Gh. [Role of mindfulness and cognitive emotion regulation strategies on predicting the psychological symptoms of medical students (Persian)]. *Education Strategies in Medical Sciences*. 2015; 8(5):301-8. <http://edcbmj.ir/article-1-872-fa.html>
- [55] Sayah M, Olapur A, Ardame A, Shahidi S, Yaghoobi Askarabad E. [Prediction of mental health and academic performance of students within cognitive emotional regulation strategies in Medical Sciences University of Jundishapur in Ahvaz (Persian)]. *Educational Development of Jundishapur*. 2014; 5(1):37-44. <https://www.sid.ir/en/journal/ViewPaper.aspx?id=373615>
- [56] Mardani S, Mehrabi H. [Prediction of depression based on cognitive emotion regulation strategies and marital satisfaction in women (Persian)]. *Knowledge & Research in Applied Psychology*. 2017; 18(3):65-75. http://jsr-p.khuisf.ac.ir/article_538043.html?lang=en
- [57] Weindl D, Knefel M, Glück T, Lueger-Schuster B. Emotion regulation strategies, self-esteem, and anger in adult survivors of childhood maltreatment in foster care settings. *European Journal of Trauma & Dissociation*. 2020; 4(4):100163. [DOI:10.1016/j.ejtd.2020.100163]
- [58] Liu C, Chen L, Chen S. Influence of neuroticism on depressive symptoms among Chinese adolescents: The mediation effects of cognitive emotion regulation strategies. *Frontiers in Psychiatry*. 2020; 11:420. [DOI:10.3389/fpsy.2020.00420] [PMID] [PMCID]
- [59] McLafferty M, Bunting BP, Armour C, Lapsley C, Ennis E, Murray E, O'Neill SM. The mediating role of emotion regulation strategies on psychopathology and suicidal behaviour following negative childhood experiences. *Children and Youth Services Review*. 2020; 116:105212. [DOI:10.1016/j.childyouth.2020.105212]

This Page Intentionally Left Blank