

Structural Equation Modeling of Pain Management Based on Rumination and Positive and Negative Emotional Regulation Mediating Vitality in Women With Breast Cancer

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Abstract

Background: Pain management in patients with breast cancer is possible when it is considered in connection with emotional regulation. In patients with emotional problems and anxiety, emotion regulation can be good predictors for controlling their negative emotions.

Objectives: This study aimed to explain the pain management model based on rumination and positive and negative emotional regulation mediating vitality in women with breast cancer.

Methods: The research method was descriptive correlation modeling (structural equations). Participants in this study were women with breast cancer referred to all medical centers (hospitals and private and public clinics) in Tehran, of whom 273 were randomly selected. To measure the research variables, rumination response questionnaires, positive and negative emotional regulation, and vitality and pain management scales were used. SPSS 22 and LISREL 8.80 software were used to perform Spearman's correlation coefficient test and path analysis for data analysis.

Results: The results showed that the indirect effect of positive emotional regulation was significant on vitality-mediated catastrophe ($\beta=-0.07$, $P\leq 0.05$). Also, the indirect effect of negative emotional regulation was significant on vitality-mediated catastrophe ($\beta=0.11$, $P\leq 0.05$).

Conclusion: It can be concluded that the pain management model based on rumination and positive and negative emotional regulation with vitality mediation in women with breast cancer has sufficient fitness.

Keywords: Pain management, rumination, positive and negative emotional regulation, vitality, breast cancer, structural equation modeling

Introduction

Breast cancer is incredibly common all around the world. It was anticipated that breast cancer caused 2.1 million malignancies in 2018, making it the sixth biggest cause of cancer deaths worldwide [1,2]. Breast cancer affects one out of every nine women in industrialized nations and one out of every twenty women in developing countries [2]. The world's age-standardized incidence rate (ASIR) is now climbing by 29% every year. This secular tendency has been attributed to changes in population age structure (16%), population

growth (12%), and cancer etiological factors (1%) [2]. In Iran, breast cancer accounts for 12.5% of all cancers, and it is the country's sixth biggest cause of mortality [1,3]. The annual ASIR for primary breast cancer, according to the Iranian National Cancer Registry (INCR), is 27.4 (per 100,000), with a crude incidence of 22.6 (per 100,000) [3,4]. Although breast cancer incidence and mortality rates are still low in the country, they have had an upward trend in recent years [5]. Patients with cancer generally experience chronic pain due to their physical problems, and they have

low pain tolerance due to physical, mental, and psychological pressures [6]. Chronic pain in these patients can cause various problems [7]. Living with chronic pain requires considerable emotional pressure. It reduces the patient's emotional abilities and ultimately weakens the patient's morale and causes feelings of hopelessness, helplessness, ruminative thoughts, and depressed mood. High levels of stress, anxiety, ruminative thoughts, and physical pain negatively affect pain management [8]. Rumination increases in patients with psychological disorders and maladaptive coping strategies such as perspiration. Rumination is one of the most important predictors of weak pain management. According to Sansones (2012), rumination is a form of preservative cognition that focuses on negative content, generally past and present, and results in emotional distress. Rumination in somatic syndromes is most studied concerning pain, and findings indicate that rumination typically intensifies pain symptoms and leads to poorer clinical outcomes. While assessment tools are limited and the treatment of rumination remains in its infancy, clearly, rumination plays an essential and emerging role in primary care settings [9].

Pain management in breast cancer patients should be seen as something related to emotion regulation. In patients with emotional problems and anxiety, emotion regulation can be good predictors for controlling their negative emotions and increasing their resilient because emotions can cause positive or negative reactions in people. Emotion regulation causes a positive reaction if proportional to the situation, and causes a negative reaction otherwise. Thus, emotions need to be adjusted in patients at different times and situations [10]. Emotion regulation as a process of initiation, preservation, adjustment, or change in the incidence of intensity or continuity of inner and emotional feelings of hope is useful in the socio-psychological process [11]. On the other hand, there is a relationship between rumination and positive-negative emotional regulation with pain management of patients in patients with breast cancer. Lack of personal dominance over conditions and having depressed mood and anxiety reduce patients' vitality, and low vitality causes negative emotion, external control, and submission to pain [12].

It should be noted that a vibrant person is a person whose vitality is expressed in individual activities and efficiency. This vitality also contagiously spreads to people in contact with this person and causes energies for others that can bring adaptability and flexibility and high resilience. Vitality increases the perception of adaptation, resilience under challenging conditions, physical health. In women with breast cancer, lack of internal motivation due to the type of disease, challenging conditions, and anxiety caused by cancer reduces mental vitality. Low vitality leads to a decrease in the patient's physical energy and adaptability [13]. Lack of vitality causes people to respond incompatibly to problems in a negative way, increases stress levels, weakens the immune system, and impairs one's ability to deal with various problems [14].

It should be noted that in patients with breast cancer, pain management is affected by physical-psychological problems, and there is a concern about what emotional and cognitive factors are related to pain management and what model can improve this critical construct to control the pain of the disease and strengthen their quality of life. It is essential to see that rumination and positive and negative emotional regulation can communicate with pain management in patients with breast cancer. In these relationships, resilience and vitality, which are two crucial components in reducing stress and improving the health of patients with breast cancer, can play a mediating role. This study aimed to explain the pain management model based on rumination and positive and negative emotional regulation mediating vitality in women with breast cancer.

Methods

The present study had a correlational (structural equation modeling) method. The statistical population of the present study was all women with breast cancer referred to medical centers (private and public hospitals and clinics) in Tehran in 2019 (n=950). Kline [15] recommended researchers to think about minimum sample size in terms of the ratio of cases (N) to the number of model parameters that require statistical estimates (q). An ideal sample size-to-parameters ratio would be 20:1. For example, in this research, a total of q= 9 model parameters require statistical estimates. Thus, an ideal minimum sample size

would be 20×9, or N=180. However, 273 patients with breast cancer were selected using the convenience sampling method to ensure more reliable results. After coordination with the authorities of the centers for the research, a list of 25-45 year old women with breast cancer stage 2 who were in the treatment process with no history of mastectomy stage (surgery to remove one or both breasts), mental retardation problems, and psychiatric (personality disorders) or psychotic diseases, with at least high school literacy, was prepared. The exclusion criterion was failure to answer all questions of the questionnaires.

All the participants received written informed consent forms and were told that participation in the study was optional and that they could withdraw from the study at any time. The participants were assured that their information remained confidential and would be used for research. The participants' names and surnames were not registered to respect their privacy.

Rumination Responses Questionnaire: This questionnaire was developed by Hoxma and Marv in 1991. This scale evaluates adverse posterior reactions and consists of two subscales of ruminative response and distraction response, each consisting of 11 phrases. The 22 phrases are scored according to Likert's spectrum from 1 (never) to 4 (most of the time). Obtaining higher scores in this questionnaire means higher rumination. Scores in this questionnaire range from 22 to 88 [10]. Bagherinejad et al. [10] reported the validity of the questionnaire to be 0.65 by correlating with the metacognitive belief questionnaire at the level of 0.001, indicating that it has high validity. Based on empirical evidence, the reliability of the questionnaire was 0.92 using Cronbach's alpha method, and its validity was 0.67 using the correlation method [11]. Also, in Bagherinejad et al.'s study [10], the reliability coefficient of the questionnaire dimensions was between 0.89 to 0.92 using Cronbach's alpha method. In this study, the reliability of the questionnaire was obtained using Cronbach's alpha method from 0.73 to 0.78.

Vitality Questionnaire: This questionnaire was created by Dassey and Ryan in 1997. It has seven questions aiming to investigate the vitality content of people in different living conditions. The scoring method of the questionnaire ranges from 1 to 7 based on a 7-degree scale, ranging from 7 to

49. Obtaining higher scores in this questionnaire means higher vitality [12]. Fabian [13] also obtained the validity of the questionnaire to be 0.41 through correlation with the happiness questionnaire at the level of 0.01 and the reliability of the questionnaire to be 0.87 through Cronbach's alpha. Rezaee et al. [12] obtained the validity of the questionnaire to be 0.44 by correlating it with the Oxford Happiness Questionnaire at the level of 0.001, and the reliability of the questionnaire to be 0.89 using Cronbach's Alpha method. In the present study, the reliability of the questionnaire was 0.76 using Cronbach's alpha method.

Positive and negative emotional adjustment questionnaire: This questionnaire was developed by Garnefski et al. in 2001 and is a multidimensional questionnaire used to identify cognitive coping strategies after experiencing adverse events or situations. This scale is a self-report tool with 36 items and has two subscales of positive (acceptance, positive refocusing, refocusing of planning, positive reassessment, and low importance) and negative (self-mutilation, rumination, catastrophizing, and other screening) emotion regulation. The scale scores range from 1 (almost never) to 5 (almost always). The positive emotion regulation scale consists of 20 items (range between 20-100), and negative emotion regulation consists of 16 items (range between 16-80). The total score is obtained from the sum of subscales. Higher scores on the positive emotion regulation subscale mean higher emotion regulation, and higher scores on the negative emotion regulation subscale, mean higher negative emotion regulation [14]. Klaassen et al. [14] obtained the validity of the questionnaire to be -0.54-0.64 and its reliability to be 0.88-0.89 using Cronbach's alpha. Besharat [15] reported the validity of the subscales to range from 0.42 and 0.49 through correlation coefficients, and the validity of the questionnaire to be 0.51 at 0.001 level. Also, the reliability of the questionnaire was reported to be 0.89 using Cronbach's alpha method, and the reliability of the subscales was reported to be 0.77. In the present study, the reliability of the questionnaire ranged from 0.75 to 0.76 using Cronbach's alpha method.

Pain Management Questionnaire: This questionnaire was developed by Osensteintown and Kiev in 1983 and has 42 strategies to deal

with psychological pain, including attention reversal, reinterpretation of pain, self-talk, ignoring pain, catastrophe, and hope, and a strategy to deal with behavioral pain including increased behavioral activity. Each strategy has six questions. Items in the questionnaire are scored between 0 and 6, ranging from no (0) to always [6]. The total score ranges from 0 to 252 [16]. Asghari Moghadam and Golak [17] reported the validity of the questionnaire to be 0.63 at the

level of 0.001 by correlating it with Howell's questionnaire. Willian [16] reported the reliability of the questionnaire to be 0.83 using Cronbach's alpha method. Asghari Moghadam and Golak [17] also reported the reliability of the questionnaire to be 0.89 using Cronbach's alpha method. In the present study, the reliability of the questionnaire ranged from 0.68 to 0.77 using Cronbach's alpha method. The research proposed model is presented in Figure 1.

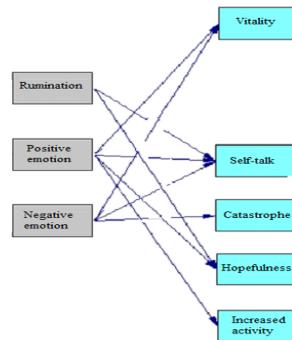


Figure 1: The research proposed model

In the inferential section, Spearman’s correlation coefficient (using SPSS 22 software) and path analysis (using LISREL 8.80 statistical software) tests were performed. Also, Kolmogorov-Smirnov test was used to evaluate the normality of the data.

Results

The mean (SD) age of the sample was 39.76 (8.54) years. The youngest member of the sample had 25 years of age, and the oldest was 45 years old. Most (89.1%) of the samples were married women, and 10.9% of the sample were single women. The mean and standard deviation of the research variables are presented in Table 1.

Table 1: Mean (SD) Research Variables

Variables	Mean	Standard deviation	Min	Max
Return attention	15.19	5.77	3	27
Reinterpretation	14.54	5.46	4	27
Self-talk	20.46	6.89	6	36
Ignoring	15.60	5.56	0	30
Catastrophe	15.33	6.75	0	33
Hopefulness	19.47	6.93	0	36
Increased activity	18.95	6.71	3	36
Ruminative response	38.19	6.01	18	50
Distracting response	37.11	5.84	25	50
Positive setting	60.27	12.09	32	88
Negative Setting	44.13	8.93	24	63
Vitality	31.30	8.60	14	49

The default use of parametric statistics is not provided, and non-parametric tests (Spearman correlation) should be used. The correlation

matrix of the research variables is presented in Table 2.

Table 2: Correlation Matrix of Research Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12
Return attention	1											
Reinterpretation	0.11**	1										
Self-talk	-0.13**	0.18**	1									
Ignoring	0.12**	0.16**	-0.11**	1								
Catastrophe	-0.18**	-0.15**	0.22**	-0.17**	1							
Hopefulness	0.22**	0.19**	0.08*	0.23**	-0.23**	1						
Increased activity	0.24**	0.18**	-0.19**	0.25**	-0.17**	0.17**	1					
Ruminative response	0.08	0.02	0.23**	-0.09	0.11	0.32**	-0.02	1				
Distracting response	0.10*	-0.13*	0.10	-0.02	0.13	0.08	-0.10	0.27**	1			
Positive setting	0.18**	0.20**	0.37**	0.12	-0.10	0.27**	0.33**	-0.25**	0.26**	1		
Negative Setting	-0.09	0.21**	0.25**	0.05	0.31**	0.13	0.17**	0.21**	-0.31**	-0.38**	1	
Vitality	0.14*	0.16**	0.08	0.08	-0.31**	-0.02	0.32**	-0.03	-0.13	0.23**	-0.38**	1

*P<0.05, ** P<0.01

The study of relationships between the variables showed that the relationships between all the variables, except the attention-reversal strategies and pain, ignoring, and distracting responses variable, were significant at $p \leq 0.01$ and sometimes at $P \leq 0.05$. The findings showed that ruminative responses directly affected a conversation with themselves and hope. Indirect effects of rumination with the mediation of vitality variables were investigated on pain management to examine the mediating role of vitality.

According to the results of Table 3, The RMSEA presented in Table 4 (0.001) was less than the

criterion value (0.05). It can be concluded that the model has good fitness. The NFI obtained in the table was (0.96), which was higher than (0.95) and showed good fitness. The CFI index obtained from the model was (0.96), indicating the appropriate fitness of the model since it is higher than the criterion (0.9). Also, GFI was obtained from the model (0.97), and considering that it is higher than the criterion (0.9), the model has a good fit. In general, indicators related to the fitness of the model indicate that the fitness of the final model has an acceptable level.

Table 3: Indicators of Final Model Fitting

Model	Index	Value	Accepted Domain	Results
Figure 1	χ^2/df	2.31	≤ 2	Lack of fit
	RMSEA	0.15	≤ 0.05	Lack of fit
	NFI	0.78	≥ 0.95	Lack of fit
	CFI	0.83	≥ 0.9	Lack of fit
	GFI	0.85	≥ 0.9	Lack of fit
Figure 2	χ^2/df	1.76	≤ 2	Fitness of model
	RMSEA	0.001	≤ 0.05	Fitness of model
	NFI	0.96	≥ 0.95	Fitness of model
	CFI	0.96	≥ 0.9	Fitness of model
	GFI	0.97	≥ 0.9	Fitness of model

Table 4 shows the indirect effect of emotional regulation on vitality-mediated pain management. The effect of emotional regulation (a) on pain management (b) was multiplied to obtain the estimation coefficient. The obtained estimation

coefficient of Sobel z was used to calculate the significance. According to Figure 2, the indirect effect of positive emotional regulation was significant on vitality-mediated catastrophe (estimated coefficient: -0.07) at $P \leq 0.05$. The

indirect effect of negative emotional regulation was also significant on vitality-mediated catastrophe (estimated coefficient: 0.11) at $P \leq 0.05$. After examining the direct and indirect

relationships between the model variables, it is necessary to investigate the indicators of the model's outcome.

Table 4: Estimation of Indirect Effect Coefficients

Indirect relationships of variables in the model	Standard estimation values	z Sobel	P-value
Positive emotion regulation on catastrophe through vitality	-0.07	-2.55	0.010
Negative emotion regulation on catastrophe through vitality	0.11	3.35	0.015

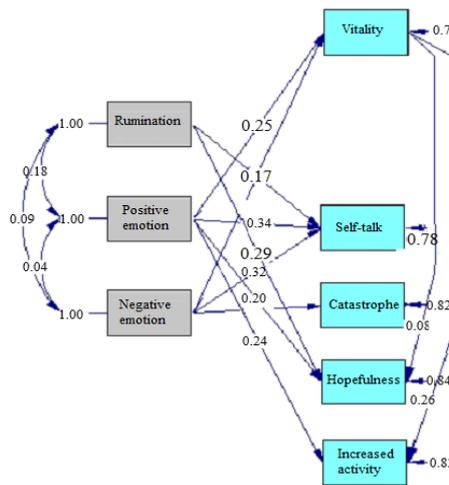


Figure 2: The Structural Model of Research and Coefficients of the Path of Variables Based on Standard Estimation Values

Based on the obtained results, the obtained model was significant regarding the relationship between rumination responses and emotion regulation with pain management and vitality mediation.

Discussion

The findings showed that rumination and positive and negative emotional regulation were related to pain management in women with breast cancer by mediating vitality. The results are in line with those obtained by Adams and te dee [18], Eldaz and Mervyn [19], Chiang, Dan, and Wheelers [20]. All the mentioned studies had different samples, and different tools were used in them compared to this research. No studies were found to be inconsistent with the present study.

In explaining this finding, it can be stated that rumination usually creates mechanisms that lead to risk factors for psychological problems, reduce

social support and optimism, and increase neuroticism [20,21]. Due to the difficult conditions of cancer patients, the vitality of these patients is severely affected. Mental vitality is one of its dimensions, which has a complex structure related to optimal functioning and experience. Therefore, reducing vitality in patients reduces their resilience and pain management. Ryan and Frederick described vitality as being full of energy, passion, and temperament and not being tired, worn out, and degraded, and showed that irritability and fatigue appeared when vitality was low. Therefore, vitality indicates a richness of positive psychological energy, and the living person is full of life. The vitality of energy comes from itself and interprets it as a feeling of energy whose source is internal and not specific environmental threats [22].

Emotion regulation is similar to people's methods of adaptation to pain. Studies have shown that

emotional empowerment makes it emotionally easy for people to face life challenges and thus makes them more mentally healthy. Aldora et al. [23] acknowledged that different types of psychopathology and mental health problems could be considered a consequence of the difficulty in emotion regulation. Difficulties in emotion regulation can lead to weak interpersonal relationships, leading to social dysfunction, mental health and physical problems, and diseases such as cancer. According to pain management theory, the data of descending and central pain neurons can be altered by positive and negative emotions. Negative emotions increase pain intensity, and positive emotions reduce pain intensity. Therefore, according to this theory, positive and negative emotions may indirectly play a role in pain management [24]. Therefore, it can be concluded that rumination responses are related to the conversation with themselves and patients' hopes. Positive emotional regulation significantly affects self-talk, hope, increased activity, and vitality in cancer patients. Also, negative emotional regulation significantly affects self-talk, catastrophe, and vitality. The indirect effect of positive and negative emotional regulation is significant on catering through vitality.

It is suggested to conduct this study on other sample groups and evaluate and compare results with the results of this study. It is also suggested to carry out this study in the form of an experimental study. The purpose is to investigate the effect of teaching different methods on pain management, rumination, positive and negative emotional regulation, and vitality in women with breast cancer. To this end, a wider community of breast cancer patients should be used to increase generalization to improve pain management, rumination, positive and negative emotional regulation, and vitality in women with breast cancer. A research cooperation agreement should be concluded between study centers and universities with hospitals and research institutes related to the statistical population to facilitate and accelerate the elimination of problems faced by the researcher. Also, specialized training is recommended by relevant organizations to improve pain management, rumination, positive and negative emotional regulation, and vitality in women with breast cancer.

The most fundamental limitation of this study was the presence of corona virus, which caused limitations such as strict observance of health protocols and social distancing between patients. Environmental and familial factors were not controlled in this study, such as family circumstances and socioeconomic status. Also, lack of sufficient research in our country made the research complex. Moreover, the complexity and frequency of the dimensions of the research variables and consequently the high number of questions in the questionnaires caused fatigue and clarity of some subjects in responding to them. This study was conducted only on the population of breast cancer patients in Tehran, and caution should be exercised in generalizing the results to other regions and cities.

Conclusion

It can be concluded that the pain management model based on rumination and positive and negative emotional regulation with vitality mediation in women with breast cancer has sufficient fitness. Considering the role of pain management based on rumination and positive and negative emotional regulation of female patients with breast cancer, it is suggested to hold educational plans and courses to promote pain management based on rumination and positive and negative emotional regulation of female patients with breast cancer.

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Conflict of interest

The authors declare that they have no conflicts of interest.

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References

1. Öcalan S, Özçetin YS. Rumination, Fatigue and Psychological Resilience in Cancer

- Experience. *Psikiyatr Guncel Yaklasimlar*. 2020; 12(3): 421-33.
2. Baghjari F, Saadati H, Esmailinasab M. The relationship between cognitive emotion-regulation strategies and resiliency in advanced patients with cancer. *Int J Cancer Manag*. 2017; 31; 10(10): e7443.
 3. Khaneshi Vatan FA, Askarian M. The Relationship between Resilience and Cognitive Emotion Regulation and Obsessive Rumination of Woman with Breast Cancer. *European Online Journal of Natural and Social Sciences: Proceedings*. 2015 Nov 27;4(1 (s)):pp-1265.
 4. Yun MR, Song M, Jung KH, Boas JY, Lee KJ. The effects of mind subtraction meditation on breast cancer survivors' psychological and spiritual well-being and sleep quality: a randomized controlled trial in South Korea. *Cancer Nurs*. 2017;40(5): 377-85.
 5. Farahi S, Khalatbari J. Effectiveness of acceptance and commitment therapy on the life expectancy, resilience and death anxiety in women with cancer. *International Journal of Applied Behavioral Sciences*. 2019;6(3):9-19.
 6. Raines AM, Vidaurri DN, Portero AK, Schmidt NB. Associations between rumination and obsessive-compulsive symptom dimensions. *Pers Individ Differ*. 2017; 113: 63-7.
 7. Liu J, Peh CX, Mahendran R. Body image and emotional distress in newly diagnosed cancer patients: The mediating role of dysfunctional attitudes and rumination. *Body Image*. 2017; 20: 58-64.
 8. Horibe K, Hasegawa A. How Autistic Traits, Inattention and hyperactivity-impulsivity symptoms influence depression in nonclinical undergraduate students? Mediating role of depressive rumination. *Curr Psychol*. 2020; 39(5): 1543-51.
 9. Sansone RA, Sansone LA. Rumination: Relationships with physical health. *Innov Clin Neurosci*. 2012; 9(2): 29-34.
 10. Bagherinezhad M, Salehi Fardadi J, Tabatabayi S. The relationship between rumination and depression in a sample of Iranian student. *Res Clin Psychol Counsel*. 2010; 11(1): 21-38. [In Persian]
 11. Gustavson DE, du Pont A, Whisman MA, Miyake A. Evidence for transdiagnostic repetitive negative thinking and its association with rumination, worry, and depression and anxiety symptoms: A commonality analysis. *Collabra: Psychol*. 2018; 4(1): 13.
 12. Rezaee Z, Esmaili M, Tabaeian S. The Influence of Group Training of Health Promoting Life Style on Vitality, Pleasure and Social Adjustment among Women with Type II Diabetic in Isfahan City. *Jundishapur Sci Med J*. 2016; 15(5): 581-590.[In Persian]
 13. Ural A, Kizilkaya Beji N. The effect of health-promoting lifestyle education program provided to women with gestational diabetes mellitus on maternal and neonatal health: a randomized controlled trial. *Psychology, Health & Medicine*. 2021 Jul 3;26(6):657-70.
 14. Strain JJ. The psychobiology of stress, depression, adjustment disorders and resilience. *World J Biol Psychiatry*. 2018; 19(sup1): S14-20.
 15. Besharat M, Ganji P. The moderating role of attachment styles on the relationship of alexithymia with marital satisfaction. *Journal of Fundamentals of Mental Health*, 2013; 4(56): 324-35. [In Persian]
 16. Mary EM, Patra S. Relationship between forgiveness, gratitude and resilience among the adolescents. *Indian J Posit Psychol*. 2015; 6(1): 63.
 17. Strijk JE, Proper KI, Van Mechelen W, Van Der Beek AJ. Effectiveness of a worksite lifestyle intervention on vitality, work engagement, productivity, and sick leave: results of a randomized controlled trial. *Scand J Work Environ Health*. 2013;39(1): 66-75.
 18. Borgi M, Collacchi B, Ortona E, Cirulli F. Stress and coping in women with breast cancer: unravelling the mechanisms to improve resilience. *Neuroscience & Biobehavioral Reviews*. 2020 Dec 1;119:406-21.
 19. Baghjari F, Saadati H, Esmailinasab M. The relationship between cognitive emotion-regulation strategies and resiliency in advanced patients with cancer. *International Journal of Cancer Management*. 2017 Oct 1;10(10):e7443.
 20. Khaneshi Vatan FA, Askarian M. The Relationship between Resilience and Cognitive Emotion Regulation and Obsessive Rumination of Woman with Breast Cancer. *European Online Journal of Natural and Social Sciences: Proceedings*. 2015 Nov 27;4(1 (s)):pp-1265.
 21. Sakellariou VI, Poultsides LA, Ma Y, Bae J, Liu S, Sculco TP. Risk assessment for chronic

pain and patient satisfaction after total knee arthroplasty. *Orthopedics*. 2016; 39(1):55-62.

22. McComb SE, Mills JS. Young women's body image following upwards comparison to Instagram models: The role of physical appearance perfectionism and cognitive emotion regulation. *Body Image*. 2021;38: 49-62.

23. Li L, Zhu X, Yang Y, He J, Yi J, Wang Y, Zhang J. Cognitive emotion regulation: characteristics and effect on quality of life in women with breast cancer. *Health Qual Life Outcomes*. 2015; 13(1): 51.

24. Moksnes UK, Lazarewicz M. The association between stress, resilience, and emotional symptoms in Norwegian adolescents from 13 to 18 years old. *J Health Psychol*. 2019; 24(8): 1093-102.