Model of Hope in Breast Cancer Patients after Surgery

Amin Rafiepoor[1], Majid Safarinia[2],Nasrin Hosseini[3*]

Abstract

Objective: The present study determined the fit of hope model based on spiritual health, body image, family support, and health locus of control mediated by social comparison in patients with postoperative breast cancer.

Method: The sample of the study included 400 women selected using the purposive sampling method from patients with breast cancer who after surgery referred to Imam Khomeini Hospital in Tehran in the spring and summer of 2021. Data collection tools included Gibbons and Buunk's Social Comparison Orientation Scale (1993), Khodapnahi et al.'s Social Support Questionnaire (2009), Schneider Hope Scale (1991), Paloutzian and Ellison's Spiritual Well-Being Scale (1982), Cash, Winstead, and Janda's Body Image Questionnaire (1985), and Wallston et al.'s multidimensional Health Locus of control scales (1978).

Results: The hope model based on spiritual health, body image, family support, and health locus of control mediated by social comparison in postoperative breast cancer patients had a good fit. Also, spiritual health (r = 0.48), body image (r = 0.46), family support (r = 0.37), and health locus of control (r = 0.23) had a direct correlation and indirect effect on the variable of hope mediated by social comparisons.

Conclusion: In order to increase the hope as the inner force needed to fight breast cancer, we can improve the quality of spiritual health, positive body image, family support, source of health control, and social comparison.

Keywords: Biopsychosocial, Breast Cancer, Hope, Mastectomy.

Introduction

Cancer is a disorder characterized by abnormal cell growth and loss of cell differentiation (Mehdipour, Rafiepoor & Haji Alizadeh, 2019). Breast cancer is the third most common cancer in the world and the most common cancer in women. It accounts for about one-third of all cancers in women and is the leading cause of death in women aged 35 to 45 (McKinney, Sieniek, Godbole, Godwin, Antropova, Ashrafian, et al., 2020). The increasing growth of cancer, especially breast cancer as the second most common cancer in women in recent decades,

and its harmful effects on all physical, emotional, spiritual, social, and economic dimensions of human beings, has attracted the attention of experts more than ever (Britt, Cuzick, & Phillips, 2020). Although cancer is a physical disease, in addition to physical problems such as pain, extreme tiredness, sleep disorders, nausea, and sexual problems, it and its therapeutic interventions are also associated with many psychological problems (García & Redondo, 2019). This disease changes the course of the individuals' lives and causes them many problems in all physical, psychological, social, economic, and family dimensions. Depression, frustration, anger, and sometimes suicidal tendencies are very common in these patients (Dorling, Carvalho, Allen, González-Neira, Luccarini, Wahlström, et al., 2021). Diagnosis of cancer and subsequent treatments such as chemotherapy and radiation therapy cause

1. Department of Psychology, Payame Noor University, Tehran,Iran.
2. Department of Psychology, Payame Noor University, Tehran,Iran.
3. PhD student, Department of Psychology, Payame Noor University (PNU),
* Corresponding Author: Nasrin Hosseini, Email: pargol1363@gmail.com

fear and anxiety for many patients due to a lack of control over pain, doubt, and uncertainty, and these issues often reduce or lose hope in patients (Ezati, Yousefi, & Valaiee, 2020). Hope has many effects on the patient's adaptation to the situation, especially during periods of pain and deprivation (Jain, Kumar, Anod, Chand, Gupta, Dey, et al., 2020). Research shows that mental health problems among cancer patients are one of the medical and nursing problems and more than two-thirds of cancer patients experience emotional disorders (Ginsburg, Yip, Brooks, Cabanes, & Caleffi, 2020). Over the past few decades, the importance of hope in cancer patients has been increasingly studied and it seems that cancer has a greater impact on patients' hope compared to other chronic diseases (Zhang, Xie, He, Ling, Li, Li, et al., 2018). Hope is the ability to access adaptive responses or meditation on cognitive processes that a person may perform after experiencing a loss (Hulett, Johnstone, Armer, Deroche, & Millspaugh, 2021). Hope is considered a multidimensional concept among the needs of the dying person and is an essential resource that helps incurable patients to adapt to mental and physical distress. In end-of-life care, hope is defined as the ability to accept a variety of information that can act without controlling frustration and denying the reality of a situation (Todorov, Sherman, & Kilby, 2019).

In the condition of experiencing cancer, the role of spiritual health as an important and prominent dimension to having a healthy life is revealed by being on the path of looking for purpose and meaning in life and at the moment when hope is threatened (Meadows, Nolan, & Paxton, 2020). Moreover, because cancer is deadly, diagnosing this disease can increase patients' spiritual needs dramatically. The diagnosis of cancer creates a significant spiritual crisis in individuals, endangers their self-confidence and beliefs, and due to uncertainty about the future, their personal communication is disrupted. The previous adaptation mechanisms seem to be insuffi-

cient, hospitalization may make a person feel lonely, and in a word, it can be said that a spiritual crisis appears in a person (Hulett, Johnstone, Armer, Deroche, Millspaugh & Millspaug, 2021). When spiritual health is seriously endangered, a person may experience mental disorders such as feelings of loneliness, depression, and loss of meaning in life (Kang, Kim, Choi, Yoon, Lee, Lee, et al., 2017). Spiritual health is one of the four dimensions of health in human beings, which is next to the physical, mental, and social dimensions and promotes general health and coordinates other dimensions of health. This increases adaptability and mental function. Spiritual health is characterized by features such as stability in life, peace, a sense of closeness to oneself, God, society, and the environment, fit and harmony, and having goals and meaning in life (Devi & Fong, 2019).

In disease conditions, especially chronic diseases such as cancer, the patient experiences stress, and the more stress caused by the disease, the more negative psychological and physiological consequences appear (Garcia, Coelho, dos Santos, Maftum, de Fátima Mantovani & Kalike, 2017). As breast cancer targets the female identity, it has severe psychological effects on the patient and her family. Diagnosis of this disease and its treatment stages have many effects on physical, psychological, family, social, and economic dimensions (Sadeghi & Gholamrezaie, 2019), and because of the important role the breast plays in women's gender, a woman's reaction to a real or suspected breast cancer disease may be in the form of fear of deformity, loss of sexual attraction, avoid sexual partner, and death (Sloan, Teti, & Benson, 2018).

Research has shown that cancer, in addition to causing problems in all aspects of individuals' personal, family, and social life, increases their support needs (Roksa & Kinsley, 2019). Family support is one of the emotional coping methods, and in fact, an indicator of exchanging resources and satisfying emotional needs, belonging, security, and

satisfaction between people in special circumstances in order to increase the level of well-being of the recipient (Lee, Park, Jang, & Lee, 2019). Family support leads to changes in peoples' perceptions of stressful life events such as cancer and as a result, they feel less pressure, and the effects of stress on them are reduced; then by reducing the negative psychological response, health behaviors, disease outcomes, and therapies are affected, and as a result, it causes better coping and increasing their quality of life (Fuller & Riggs, 2018). Family support refers to help, encouragement, and practical care from the family that the individual receives or perceives. Families are often seen as the first source of care and support for members (Chan, Kalliath, Chan, & Kalliath, 2020).

Because breast cancer is associated with physiological and psychological mechanisms, variables such as the health locus of control can play an important role in the health beliefs of patients with cancer (Brown, Thaker, Sun, Urbauer, Bruera, Bodurka, et al., 2017). The health locus of control is a person's beliefs based on past experiences and experiences with health issues and having internal or external control over them can somehow affect health. People who have a source of internal control have a strong belief in adopting health behaviors and know themselves as responsible for their own health (Lima, Moret-Tatay, & Irigaray, 2021). On the other hand, people who have a source of external control usually act passively, do not know themselves as directly responsible for their own health, and always believe in the impact of fate, luck, the physician, and the power of others on their illness or health. Furthermore, the health locus of control is one of the psychological components in people's perception of their control over various life events (Kim & Baek, 2019).

Chronic diseases often make people encounter the behavioral, cognitive, and emotional challenges associated with managing progressive symptoms. People with breast cancer are more likely to come

across other patients' daily lives and compare their conditions with theirs (Gerber, Wheeler, & Suls, 2018). Comparing oneself with others, referred to as social comparison, is one of the factors that can increase or decrease such motivation. Patients with high motivation are more likely to show desirable behavioral changes (Park & Baek, 2018). Comparing oneself with others is a common feature of human social life and a pervasive social phenomenon (Buunk & Schaufeli, 1993). Due to the relatively high prevalence of breast cancer in Iran and the psychological, physical, and family-social complications of this disease, measures to identify the psychological and intra-psychological factors affecting the psychological well-being of these patients are necessary. Accordingly, and considering the above-mentioned issues and the necessity of examining and identifying the predicators of hope in people with cancer, the present study sought to answer the research question of whether the model of hope in postoperative breast cancer patients fit based on spiritual health, body image, family support, and health locus of control mediated by social comparison.

Among those with no previous psychiatric history, a cancer diagnosis is associated with an increased risk of common mental disorders, which can affect the treatment and improvement of cancer and the quality of life and survival of the patients (Zhu, Fang, Sjölander, Fall, Adami, & Valdimarsdóttir, 2017). These reports indicated that cancer has significant physical and psychological effects. However, in addition to the physical and psychological dimensions, the experience of cancer also has important socio-cultural aspects (Dehghan, Hassani, Moradi, & Mohammadkhani, 2021). In fact, the novelty and innovation of this research are that in defining health and possible factors related to hope in cancer patients, it has also examined the definition of the World Health Organization (2013), which considers health as a state of complete physical, mental, social, and spiritual well-being, not just the absence of disease and disability,

and also investigating the physical, psychological, spiritual, and social components in the model of predicting patients' hope.

Method

The present study was descriptive-correlational performed through structural equation modeling. The statistical population of the study included all patients with breast cancer after surgery referred to Imam Khomeini Hospital in Tehran between April and September 2021. The sample of this study included 400 people selected through the purposive sampling method and based on inclusion criteria. In this study, 6 main variables (5 independent variables and one dependent variable with an average of three components for each variable) were examined. According to Klein's theoretical framework (1998), to collect data, 360 subjects were required (considering 20 samples for each component); however, in order to control the probability of the subject falling and achieve more reliable results, the number of samples was increased to 400.

Inclusion and Exclusion Criteria

Inclusion criteria included the history of breast cancer according to the diagnosis of an oncologist for at least 6 months, mastectomy surgery, contentment to participate in the study, no serious medical or psychiatric illness other than breast cancer (based on medical records), and no drug abuse (based on medical records). The exclusion criteria were having obvious mental and cognitive problems, lack of literacy in at least first grade of middle school, having psychiatric disorders (based on medical records), drug abuse, and failure to answer all questions of questionnaires.

Data Collection and Procedure

In order to collect data, after obtaining the code of ethics, obtaining the consent of the officials of the centers and obtaining the license, and selecting the members of the sample groups, the participants were given explanations about the general process of the study. In the case of their agreement to participate in the research and after giving a series of initial information about the research, the questionnaires were provided to them.

It should be noted that in order to observe the patients' state and complete answers to all questions, the questionnaires were prepared online, and after coordination and obtaining patients' consent for participating in the study, the link was sent to patients to answer all the questionnaires carefully at the proper time. In total, the questionnaires were completed by 434 patients. In the process of scoring and analysis, 46 questionnaires were removed due to the incomplete answers or having a low score, and the patient selection continued until the sample size reached 400 for analysis.

Ethical statement

This trial was registered in the Iranian Registry of Clinical Trials (ethics code: IR.PNU.REC.1400.089). Prior to implementation, the purpose of the study and other conditions were explained to the patients. It was ensured that the information would remain confidential to the researcher. The informed consent form was taken from patients.

Measures

1- *Social Comparison Orientation Scale:*

This scale was developed by Gibbons and Buunk (1993) to measure individual differences in social compar-ison orientation. This scale has 11 items and two subscales of ability and belief, which are scored on a five-point Likert scale: strongly disagree, dis-agree, have no opinion, agree, and strongly agree.

The scores range of this tool is from 11 to 55. Gibbons and Buunk (1999) reported the reliability of the scale between 0.77 and 0.86 in different samples and using criterion-dependent validity methods and structural validity confirmed the validity of the scale. Psychometric properties of this instrument have been studied by Ahmadi Gozloujeh and Mehdizadeh Tavasani (2019) in Iran and Cronbach's alpha coefficient has been obtained at 0.72. In the present study, the reliability of this scale was 0.79

by Cronbach's alpha method.

2- *Family Social Support Questionnaire:* This questionnaire was designed by Khodapanahi et al. (2009) to assess the social support of chronic patients. The questionnaire has 79 items based on a four-point Likert scale, ranging from strongly agrees to strongly disagree and scores range is from 79 to 316. In this study, the validity of this questionnaire was obtained at 0.97 through Cronbach's alpha.

3- *Hope Scale:* This self-reported questionnaire was developed by Schneider et al. in 1991 to measure hope and has 12 terms. Scoring is done in the form of a 4-point Likert scale from completely disagree with a score of 1 to completely agree with a score of 4, and the range of scores is between 12 and 48, in which a higher score indicates higher hope of the individual. Schneider et al. (1991) confirmed its construct validity. They also obtained the reliability of the scale through Cronbach's alpha at 0.74, which indicated the internal consistency of the questionnaire. Kermani et al. (2011) in examining the psychometric properties of the Schneider hope Scale, obtained the reliability coefficient of the scale 0.86 by the use of Cronbach's alpha coefficient formula and 0.81 through a month's interval retest. In this study, the reliability of this questionnaire was 0.87 using Cronbach's alpha.

4- *Spiritual health Scale:* This scale was developed by Paloutzian and Ellison (1982) and has 20 items and measures the quality of perceived spiritual life in the three areas of religious well-being, existential well-being, and general spiritual well-being on a 6-point Likert scale from one to six. Therefore, the range of the scores varies between 20 and 120. Religious well-being measures the degree of a person's satisfying relationship with God, and existential well-being measures the sense of satisfaction with life and having a purpose in life. Higher scores indicate higher levels of well-being and spiritual satisfaction. Aghahosseini et al. (2009) reported the reliability coefficient of the retest Spiritual Health Scale as 0.91. In this study, the reliability of this questionnaire was 0.77 using Cronbach's alpha.

5- *Body Image scale:* This questionnaire was developed by Cash, Winstead, and Janda (1985) and contains 68 self-reported questions. This scale consists of two parts: mental engagement and evaluation of one's weight. Its scoring is based on a 5-point Likert scale from 1 for "completely dissatisfied" to 5 for "completely satisfied" and gives a score between 68 and 340. The validity of the main sections of this questionnaire was reviewed and confirmed by Brown et al. (1990). Its reliability is also reported at 0.81. The reliability of this instrument in Iran on the subscale of appearance awareness was 0.87, evaluation of appearance was 0.85, concern about weight gain was 0.82, satisfaction from different parts of the body was 0.79, and weight evaluation from the individual's point of view was 0.75 (Soltani et al., 2017). In this study, the reliability of this questionnaire was 0.78 using Cronbach's alpha.

6- *Multidimensional Health Locus of control scales:* This scale was developed in 1978 by Wallston et al. to determine the source of individual health control. This questionnaire helps predict health behaviors based on individual beliefs and has three forms A, B, and C, each of which consists of eighteen questions, and each component has six items. Forms A and B are mainly used for healthy people, version A is specified for public health measurements, and form C is used for special situations and can be used instead of form A or B for people who have health and medical problems such as diabetes, cancer, etc. In this study, Form C was used, which has 18 questions. The scoring is based on a 6-point Likert, from strongly disagree (1) to very agree (6) and its score range is between 18 and 108. The properties of this tool have been examined and approved by Mani, Ahsanat, Nakhlparvar, and Asadi Pouya (2018) in Iran. The reliability of this questionnaire in Mani et al.'s study was 0.85. In this study, the reliability of this questionnaire was 0.79 using Cronbach's alpha.

Results

In this study, 400 patients with breast cancer with a mean age of 37.3 years participated. Most women had a diploma (49.25%) and the lowest number was related to secondary education (5.75%).

comparison, and hope were statistically significant (P<0.05). Before performing path analysis, the four main assumptions of the path analysis model, including missing data, skewed data, normality, and multiple alignments, were confirmed. Then the fit

Table 1. Descriptive statistics of research variables (n = 400)

Variable	Mean	SD	minimum	Maximum
Social comparison orientation	22.21	5.65	12	34
Family social support	156.52	38.25	130	238
Hope	37.29	6.31	17	47
Spiritual well-being	1.18	16.98	63	99
Body image	146.41	29.16	77	161
Health locus of control	79.47	16.10	57	121

Since the basis of path analysis is the correlation matrix between variables, the correlation matrix is reported first (Table 2).

of the hope model was examined. The results of the implementation of the initial model in the standard model along with some of the most important

Table 2. Correlation matrix between research variables

Variable	1	2	3	4	5	6
Social comparison orientation	1					
Family social support	0.13**	1				
Hope	0.17**	0.39**	1			
Spiritual well-being	0.28**	0.26**	0.36**	1		
Body image	0.29**	0.33**	0.35**	0.18**	1	
Health locus of control	0.22**	0.27**	0.29**	0.18*	0.27**	1

P<0/01**

As Table 2 indicates, the correlation coefficients between the subscales of spiritual health, body image, family support, health locus of control, social

indicators of model fit are presented in Figure 1 and Table 3.

In general, in working with the Amos program, each

Table 3. Model fit indices

Index name	Fit indicators	
	Value	Limit
$\dfrac{\chi^2}{df}$	0.11	Below 3
RMSEA	0.001	Below 0/.1
CFI	0.98	Above 0.9
NFI	0.98	Above 0.9
GFI	0.97	Above 0.9
AGFI	0.97	Above 0.9
AIC	187.16	Smaller values compared to other models
BIC	204.44	Smaller values compared to other models

of the obtained indicators is not the reason for the fitness or inadequacy of the model alone, and these indicators should be interpreted together. According to Table 3, the obtained values indicate that the social comparison variable in the model can play a mediating role between spiritual well-being, body image, family support, and a health locus of control and hope in breast cancer patients. Because the values of fit index or GFI, modified fit index or AGFI, soft fit index or NFI and adjusted fit index or CFI in the model are more than 0.9. Also in fitted models, the ratio of Chi-square to the degree of freedom X2/df should be in the range of 1 to 3, which in this model, the ratio of Chi-square to the degree of freedom X2/df is in the range of 1 to 3. Meanwhile, the root mean square error

of approximation or RMSEA should be less than 0.09, that is 0.001 in this model, which indicates that the validity of the model is desirable. In general, the values obtained for these indicators show that in general, the model is in a good position to explain and fit.

According to Table 4, spiritual health, body image, family support, health locus of control, and social comparison had a direct effect on hope. Therefore, the hypothesis stating the relationship between spiritual health, body image, family support, health locus of control, and social comparison with hope is confirmed with 95% confidence. To examine the indirect effect of spiritual health, body image, family support, health locus of control, and social comparison on hope, the Sobel test was used (Table 5).

Table 4. Coefficients and significance of the direct effect of variables on social comparison and hope

Criterion variable	Predictor variable	Non-standardized coefficient	standardized β	Significance statistics	P
Hope	Spiritual health	0.39	0.48	8.55	<0.01
Social comparison	Spiritual health	0.46	0.58	10.60	<0.001
Hope	Body image	0.23	0.46	8.20	<0.001
Social comparison	Body image	0.10	0.18	3.75	<0.01
Hope	Family support	0.10	0.35	3.55	<0.001
Social comparison	Family support	0.29	0.35	7.60	<0.001
Hope	Health locus of control	0.25	0.47	8.53	<0.01
Social comparison	Health locus of control	0.13	0.20	4.75	<0.01
Hope	Social comparison	0.14	0.26	4.93	<0.001

Table 5. Coefficients and significance of indirect effect of variables on hope

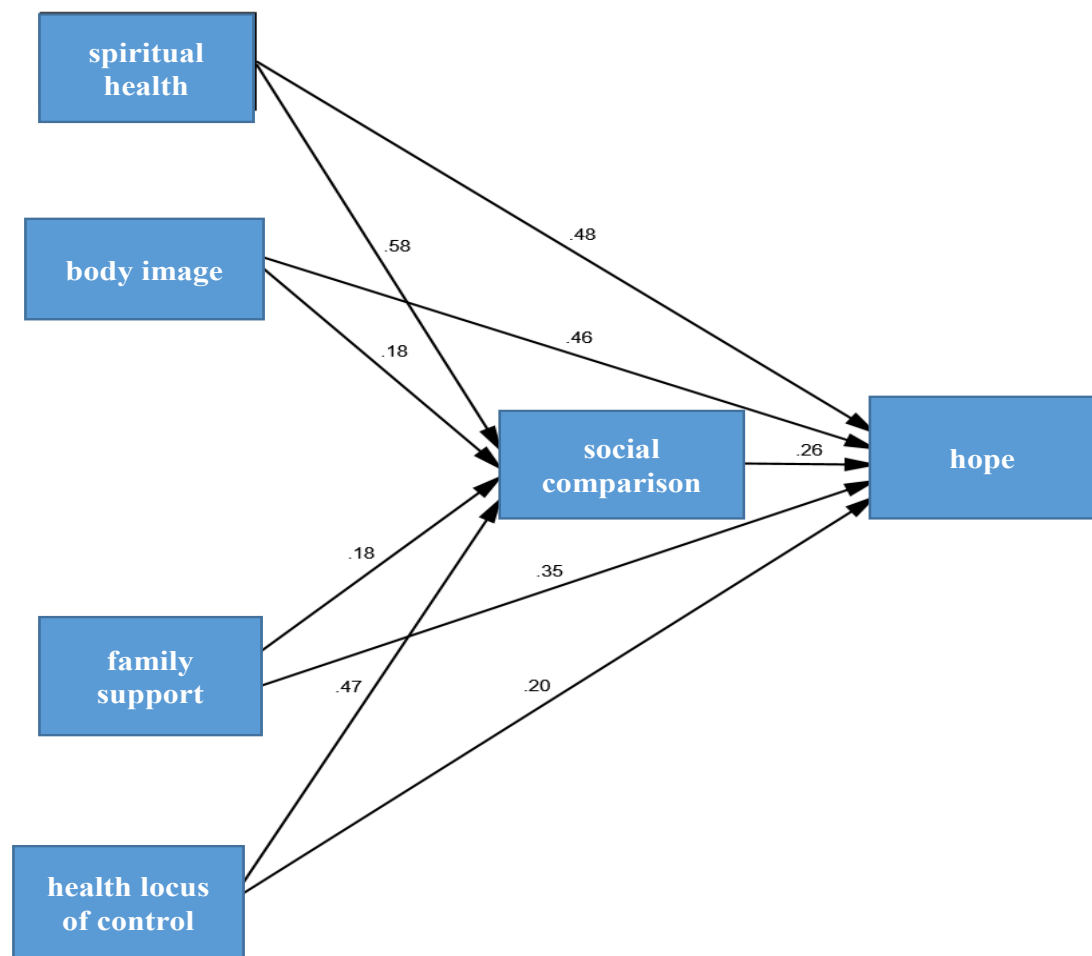| Criteria	Predictor variable	Non-standardized coefficient	standardized β	Sobel statistic	P
Hope	Spiritual health	0.53	0.46	8.31	<0.001
Hope	Body image	0.62	0.58	10.64	<0.01
Hope	Family support	0.30	0.18	3.75	<0.01
Hope	Health locus of control	0.35	0.31	3.80	<0.001

**P<0.01

Figure 1: Model of Hope based on spiritual health, body image, family support, health locus of control, and social comparison with mediating role of social comparison (in standard mode)

According to the results, the model of hope based on spiritual well-being, body image, family support, and health locus of control mediated by social comparison in patients with breast cancer after surgery has a good fit and spiritual well-being($r = 0.48$), body image ($R = 0.46$), family support ($r = 0.37$), and health locus of control ($r = 0.23$) had a direct correlation, as well as an indirect effect mediated by social comparisons with the variable of hope ($P < 0.05$).

Discussion and Conclusion

The present study is a descriptive-correlational study performed by structural equation modeling to determine the fit of hope model based on spiritual well-being, body image, family support, and health locus

of control mediated by social comparison in patients with postoperative breast cancer. The results showed that spiritual health, body image, family support, health locus of control, and social comparison have a direct effect on hope. The social comparison also plays a mediating role in the relationship of spiritual health, body image, family support, and health locus of control with hope. In explaining the findings, it can be said that having chronic diseases such as breast cancer causes changes in patients' social interactions with the physical and social environment and their relationship with family and friends. Studies show that people who suffer from breast cancer are at greater risk for psychosocial problems such as unpleasant body image, fear of rejection, despair, fear of independence, and worry about self-

sufficiency that changes their self-concept (Torek & Waler, 2020). These physical and psychological problems that result from breast cancer can lead to frustration, decreased social functioning, poor social interactions, and ultimately reduced patients' hopes. Breast cancer changes a person's level of hope. Hope is a sign of mental health and belief in a better future, while despair is the opposite of hope and one of the characteristics and manifestations of depression. Explaining the relationship between family support and patients' hope, it can be said that the attention and respect we receive during social communication and the feeling of satisfaction and well-being that results from it, can serve as a protector against health problems. Rabb (2007) examined women with breast cancer and found that support and inhibition as core variables affect women's hope.

Support from family, friends and survivors of cancer is a key variable in women's definition of hope. Stress due to unsupported interactions with family or friends also plays an important role in the psychological helplessness of cancer patients (Mirzaei, Gholami, Zabolian, Saleki, Farahani, Hamzehlou, et al., 2021). Also, hope is formed based on the support of the patient's family and relatives. Family support is played by important people involved in the patient's life, in particular through instrumental support, including material resources such as transportation, money, assistance with daily household chores, and emotional support. Instrumental support can compensate for the patient's sense of loss of control during the illness by providing tangible resources for his or her use. Instrumental support can be considered a prerequisite for emotional support because emotional support not only does not play a role in hope, it can also threaten it. However, this type of support, along with other care, can provide social support for the patient from important people in their life. On the other hand, it can be said that because cancer patients face many challenges to solve problems related to their illness, their tolerance threshold is lowered and ultimately their ability to

adapt to others is reduced often causing inappropriate reactions and boredom. Sometimes they even avoid talking about their illness to others and try to hide their disease from others (Zalta, Tirone, Orlowska, Blais, Lofgreen, Klassen, et al., 2021). Therefore, adaptation to changes in a person's lifestyle requires planning and this planning should be according to the new conditions and in using appropriate components of spiritual health that lead to the patient's adaptation because adaptation to cancer occurs over time.

Spiritual health, by giving hope and meaning to people's lives and encouraging them to endure problems, creates a positive attitude towards life, and certainly, such an attitude also leads to an increase in the quality of life (Shatte, Hutchinson & Teague, 2019). Spiritual health motivates and empowers patients by creating meaning and purpose in their lives and helps them to evaluate and perceive their ability and energy to perform their activities despite their illness and because of the peace of mind associated with God, they will be less aware of the stresses of illness and less likely to have sleep disorders. Families express specific behaviors and feedback depending on their emotional abilities between them. Families with good communication among their members can be more successful and better at helping their patients. Family support plays an important role in raising the quality of life, progress in the treatment process, faster recovery of the disease, and increasing hope in the patient. Research findings show that there is a positive relationship between emotional support and family encouragement and the course of illness recovery, meaning that the more and more positive the support of the family, the faster the recovery process will be and the patients who receive this support will be in a better mood than other patients and react to the treatment process and its complications with a more positive spirit (Kim & Behnolar, 2020). In General, social support, which is a subjective perception of meaningful care and concern for others, makes resilience and hope, encouraging people to face

adversity that improves their adjustment and quality of life (Spatuzzi, Vespa, Lorenzi, Miccinesi, Ricciuti, Cifarelli, et al., 2016). Thus, it seems that social support indirectly affects patients' resilience through hope. In patients with high hope, social support has a positive effect on resilience. For instance, low symptom severity and high hope were positively associated with resilience in 204 breast cancer patients in South Korea receiving chemotherapy (Yang & Kim, 2016).

Regarding body image disorders, according to many studies, this variable is negatively associated with resilience in cancer patients. For example, Ristevska-Dimitrovska, Stefanovski, Smichkoska, Raleva, and Dejanova (2015) showed that poor body image is associated with low flexibility and poor quality of life. Another review of 12 qualitative studies has shown that in patients with breast cancer, the loss of breasts and the loss of perception of the integrity of the body structure lead to a loss of overall sense of harmony and symmetry of the body (Sun, Ang, Ang & Lopez, 2018). Explaining this finding, it can be said that changes in body image in women with breast cancer can be explained in the context of each woman's socio-cultural life where it affects the main aspects of identity, femininity, and sexual function. Those who live with these problems may experience a degree of social isolation, detachment from social interactions, and thus reduced mental health ((Turk & Waller, 2020). Many problems in breast cancer patients seem to be related to the trauma of breast removal and the effects of this trauma on their quality of life and the mental image of their body after surgery. After a mastectomy, the patient experiences conditions such as amputation of an organ. The breast is a symbol of gender, femininity, and motherhood and by removing it, women suffer a lot of stress and are probably prone to mood disorders such as depression, anxiety, and impaired mental image of the body (Radwan, Hasan, Ismat, Hakim, Khalid, Al-Fityani, et al., 2019).

Disappointment following a negative image resulting from changes in the disease affects the quality of life of these people and reduces their cooperation in the treatment and acceptance of care interventions. Hope provides the inner strength needed to maintain emotional stability and a positive outlook during breast cancer treatment which is often painful and deformed (Hatamipour, Rassouli, Yaghmaie, Zendedel & Majd, 2015). Studies of cancer patients have identified a strong positive relationship between body image distress and emotional distress (Liu, Griva, Lim, Tan & Mahendran, 2017; Lee, Park, Jang & Lee, 2018) and recognized the protective effects of hope against emotional distress, including anxiety and depression (Peh, Liu, Bishop, Chan, Chua, Kua, et al. 2017). Hope also protects people against the stress of experiencing cancer and its negative effects (Todorov, Sherman, Kilby & Breast Cancer Network et al., 2019). For cancer patients under acute and chronic stress, hope is an essential internal resource because it increases flexibility and thus improves the quality of life (Lee et al., 2016; Solano, da Silva, Soares, Ashmawi & Vieira, 2016). The literature review shows that hope has a protective effect on cancer patients by reducing body image distress and increasing flexibility. Cancer patients who receive strong social support can effectively manage the distress caused by body image changes (Spatuzzi et al., 2016) and tend to have high flexibility (Alizadeh, Khanahmadi, Vedadhir & Barjasteh, 2018). Explaining this finding, it can be said that the emotional support that patient receives from the family helps her to feel sympathy, encouragement, and expression of sufficient love from the family. This leads the patient to feel that there are people who support her in these difficult and critical situations; therefore, it is easier for her to deal with the disease or adapt to it and avoid isolation and get more cheerful and encouraged (Wang, Xu, Wang, Zhai & Chen, 2018).

In order to explain the effect of health locus of control on hope in cancer patients, we can refer to research that showed that patients who believe

they can play a role in controlling and preventing the disease, perform behaviors such as praying, changing diet, proper diet, exercise, and how to eat and improve their quality of life. It can also be said that patients who have an internal health locus of control are less tendency to alcohol consumption and other unhealthy behaviors. It can also be an effective internal health locus of control in disease prevention and life expectancy and hope because people with an internal health locus of control believe that health, hygiene, and quality of life are in their own hands and they engage in health behaviors that help them diagnose and control stress (Boyd & Wilcox, 2020). People with internal health locus of control see their life events to some extent at their own discretion and as a result of their chosen behaviors, in the event of a problem such as illness, they can coordinate their behaviors to improve and increase their health. On this basis, cancer people with an internal locus of control, more easily accept and adapt to their disease and also do their best to improve their health states with the right choices. In explaining these findings, it is worth mentioning that a study on women who survived breast cancer showing a belief that lifestyle plays a role in cancer may motivate women to make positive changes in their health habits after cancer treatment. In addition, people who believed that cancer was beyond their control and that God had determined their fate had given in and had no motivation to perform preventive tests because they believed that their disease was from God to test their faith (Kawar, 2013).

Regarding the effect of social comparison, it should be noted that comparators may have an upward comparison or a downward comparison depending on the purpose of the comparison. But the effect of comparison on self-assessment and their emotional response depends largely on the degree to which they feel they can change or control a questionable trait or feature. If the comparators assume that the characteristics and traits of the target are better than their characteristics and traits, it is called an upward

comparison and on the other hand, if the comparators perceive that they are better than the person with whom they compare themselves, it is called a downward comparison. A person who compares herself to a higher or lower person naturally achieves a positive or negative self-assessment (Thompson, Pérez, Kreuter, Margenthaler, Colditz & Jeffe, 2017). The nature of self-assessment (positive or negative) is not directly affected by social comparison. For example, if a person compares herself to a person who is at a higher level in terms of appearance and physical abilities (comparison with a higher person), but ensures that she can reduce this difference with more practice and action, this comparison with a higher person cannot lead to a negative emotional response, but rather increase negative emotions.

In general, to fight breast cancer, women rely on various internal and external sources. Hope as an internal resource provides the inner strength needed to fight breast cancer (Liu et al., 2017). In this regard, efforts should be made to increase people's confidence in the health system and increase their confidence in their ability to fight diseases such as breast cancer since not having fears and negative predictions about breast cancer gives them hope. As women think that the end of breast cancer is death, they have less hope for recovery. However, if they hope to recover and believe that illness does not lead to death, they become encouraged and hopeful and play a more active role in controlling their illness.

Therefore, considering the role of hope based on spiritual health, body image, family support, health locus of control mediated by social comparison in post operation breast cancer patients, it is suggested that programs and training courses be held to promote hope based on spiritual health, body image, family support, and health locus of control for breast cancer patients after surgery. Because hope is a barrier against negative and stressful events in the experience of cancer, reducing body image distress and increasing flexibility creates a protective effect in cancer patients.

Research Limitations

The present study, like any other research, had the following limitations: for example, in this study, due to a large number of samples and questionnaires, no other criteria were screened to determine whether participants had other psychological problems or not; therefore, the comorbid effects of the disorders were not eliminated which may affect the research results. Another limitation was the lack of studying personality traits, level of education, and socio-economic status of patients as moderating variables. Another limitation of the study was that the sample may not represent the general population of Iranian women with breast cancer which may influence the generalizability of the findings. On the other hand, this study was cross-sectional and patients were evaluated at a specific point in their follow-up.

Therefore, it is suggested that more accurate criteria be used in future research in order to screen and determine whether participants had other psychological problems. Also, the personality traits, level of education, and socio-economic status of patients should be examined in future studies.

References

Ahmadi Ghozlojeh, A., & Mehdizadeh Tavasani, A. (2019). Factorial structure and psychometric properties of Persian Version of Social Comparisons Orientation Scale (SCOS). *Rooyesh-e-Ravanshenasi Journal(RRJ); 8(6):* 209-216.

Alizadeh, S., Khanahmadi, S., Vedadhir, A., & Barjasteh, S. (2018). The relationship between resilience with self-compassion, social support and sense of belonging in women with breast cancer. *Asian Pac. J. Cancer Prev. 19,* 2469–2474.

Boyd, J. M., & Wilcox, S. (2020). Examining the relationship between health locus of control and God Locus of Health Control: Is God an internal or external source? *Journal of health psychology, 25*(7), 931-940.

Britt, K. L., Cuzick, J., & Phillips, K. A. (2020). Key steps for effective breast cancer prevention. *Nature Reviews Cancer, 20*(8), 417-436.

Brown, A. J., Thaker, P. H., Sun, C. C., Urbauer, D. L., Bruera, E., Bodurka, D. C., & Ramondetta, L. M. (2017). Nothing left to chance? The impact of locus of control on physical and mental quality of life in terminal cancer patients. *Supportive Care in Cancer, 25*(6), 1985-1991.

Buunk, B. P., & Schaufeli, W. B. (1993). Burnout: A perspective from social comparison theory. In W. B. Schaufeli, C. Maslach, & T. Marek (Eds.), Professional burnout: Recent developments in theory and research (pp. 53-66). Washington, DC: Taylor & Francis.

Chan, X. W., Kalliath, P., Chan, C., & Kalliath, T. (2020). How does family support facilitate job satisfaction? Investigating the chain mediating effects of work–family enrichment and job-related well-being. *Stress and Health, 36*(1), 97-104.

Dehghan, M., Hasani, J., Moradi, M., & Mohammadkhani, S. (2021). Cancer-Based Contextual Experiences: A Phenomenological Study of Cancer Patients. *Quarterly Journal of Health Psychology; 10(3, 39):* 51-66.

Devi, M. K., & Fong, K. C. K. (2019). Spiritual experiences of women with breast cancer in Singapore: A qualitative study. *Asia-Pacific journal of oncology nursing, 6*(2), 145.

Dorling, L., Carvalho, S., Allen, J., González-Neira, A., Luccarini, C., Wahlström, C., ... & Brüning, T. (2021). Breast Cancer Risk Genes-Association Analysis in More than 113,000 Women. *N Engl J Med,* 428-439.

Ezzati, M., Yousefi, B., Velaei, K., & Safa, A. (2020). A review on anti-cancer properties of Quercetin in breast cancer. *Life sciences, 248,* Article, No. 117463. https://doi.org/10.1016/j.lfs.2020.117463

Fuller, K. A., & Riggs, D. W. (2018). Family support and discrimination and their relationship to psychological distress and resilience amongst transgender people. *International Journal of Transgenderism, 19*(4), 379-388.

Garcia, S. N., Coelho, R. D. C. F. P., dos Santos, P. N. D., Maftum, M. A., de Fátima Mantovani, M., & Kalike, L. P. (2017). Changes in social function and body image in women diagnosed with breast cancer undergoing chemotherapy. *Acta Scientiarum. Health Sciences, 39*(1), 57-64.

García-Aranda, M., & Redondo, M. (2019). Immunotherapy: a challenge of breast cancer treatment. *Cancers, 11*(12), 1822.

Gerber, J. P., Wheeler, L., & Suls, J. (2018). A social

comparison theory meta-analysis 60+ years on. *Psychological bulletin, 144*(2), 177.

Gibbons, FX, & Buunk, BP. (1999). Individual differences in social comparison: development of a scale of social comparison orientation. *J Pers Soc Psychol; 76*: 129–42.

Ginsburg, O., Yip, C. H., Brooks, A., Cabanes, A., Caleffi, M., Dunstan Yataco, J. A., ... & Anderson, B. O. (2020). Breast cancer early detection: A phased approach to implementation. *Cancer, 126*, 2379-2393.

Hatamipour, K., Rassouli, M., Yaghmaie, F., Zendedel, K., & Majd, H. A. (2015). Spiritual needs of cancer patients: a qualitative study. *Indian J. Palliat. Care. 21*, 61–67.

Herchenhorn, D., Freire, V., Oliveira, T., & Tarouquella, J. (2021). Sequential therapies for advanced urothelial cancer: Hope meets new challenges. *Critical Reviews in Oncology/Hematology*; 160: 103248. doi: 10.1016/j.critrevonc.2021.103248.

Hulett, J. M., Johnstone, B., Armer, J. M., Deroche, C., Millspaugh, R., & Millspaugh, J. (2021). Associations between religious and spiritual variables and neuroimmune activity in survivors of breast cancer: a feasibility study. *Supportive Care in Cancer*, 1-9.

Jain, V., Kumar, H., Anod, H. V., Chand, P., Gupta, N. V., Dey, S., & Kesharwani, S. S. (2020). A review of nanotechnology-based approaches for breast cancer and triple-negative breast cancer. *Journal of Controlled Release*.

Kang, D., Kim, I. R., Choi, E. K., Yoon, J. H., Lee, S. K., Lee, J. E., ... & Cho, J. (2017). Who are happy survivors? Physical, psychosocial, and spiritual factors associated with happiness of breast cancer survivors during the transition from cancer patient to survivor. *Psycho-oncology, 26*(11), 1922-1928.

Kawar, L.N. (2013). Barriers to breast cancer screening participation among Jordanian and Palestinian American women. *Eur J Oncol Nurs*; 17: 88-94.

Kim, S., & Baek, Y. M. (2019). Medical drama viewing and healthy lifestyle behaviors: Understanding the role of health locus of control beliefs and education level. *Health communication, 34*(4), 392-401.

Kim, U., & Bhullar, N. (2020). Life in the pandemic: Social isolation and mental health. *https://onlinelibrary. wiley. com/doi/pdfdirect/10.1111/jocn. 15290.*

King B. (2007). Rethinking Claims of Spiritual Intelligence:

A Definition, Model, & Measure. Published master's thesis. Peterborough, ON, Canada: Trent University.

King, U. (2017). Spirituality. *A new handbook of living religions*, 667-681.

Lee, H. W., Park, Y., Jang, E. J., & Lee, Y. J. (2019). Intensive care unit length of stay is reduced by protocolized family support intervention: a systematic review and meta-analysis. *Intensive care medicine, 45*(8), 1072-1081.

Li, Y., Du, Y., Sun, T., Xue, H., Jin, Z., & Tian, J. (2018). PD-1 blockade in combination with zoledronic acid to enhance the antitumor efficacy in the breast cancer mouse model. *BMC Cancer.*; 18:669.

Lima, M. P., Moret-Tatay, C., & Irigaray, T. Q. (2021). Locus of control, personality, and depression symptoms in cancer: testing a moderated mediation model. *Clinical Psychology & Psychotherapy*; 29(2): 489-500.

Liu, J., Griva, K., Lim, H. A., Tan, J. Y. S., & Mahendran, R. (2017). Longitudinal study of the protective effect of hope on reducing body image distress in cancer patients. *J. Psychosocial. Oncol. 35*, 77–89.

Mani, A. , Ahsant, N., Nakhl Parvar, N. , & Asadi Pooya, AA. (2018). The Investigation of the Properties of Form C Psychometrics from the Multi-dimensional Scale of the Locus of Health Control on Normal Adults. Smsj; 7(1): 48-57.

McKinney, S. M., Sieniek, M., Godbole, V., Godwin, J., Antropova, N., Ashrafian, H., ... & Shetty, S. (2020). International evaluation of an AI system for breast cancer screening. *Nature, 577*(7788), 89-94.

Meadows, R. J., Nolan, T. S., & Paxton, R. J. (2020). Spiritual health locus of control and life satisfaction among African American breast cancer survivors. *Journal of psychosocial oncology, 38*(3), 343-357.

Mehdipour, F., Rafiepoor, A., & Haji Alizadeh, K. (2019). The Effectiveness of Mindfulness-Based Group Cognitive Therapy on Improving the Quality of Life in Patients with Cancer. *Biquarterly Iranian Journal of Health Psychology; 2(1, 3):* 125-134.

Mirzaei, S., Gholami, M. H., Zabolian, A., Saleki, H., Farahani, M. V., Hamzehlou, S., ... & Sethi, G. (2021). Caffeic acid and its derivatives as potential modulators of oncogenic molecular pathways: New hope in the fight against cancer. *Pharmacological Research*; *171*: 105759. doi: 10.1016/j.phrs.2021.105759.

Peh, C. X., Liu, J., Bishop, G. D., Chan, H. Y., Chua, S.

M., Kua, E. H., et al. (2017). Emotion regulation and emotional distress: the mediating role of hope on reappraisal and anxiety/depression in newly diagnosed cancer patients. *Psycho-Oncology 26*, 1191–1197.

Radwan, H., Hasan, H. A., Ismat, H., Hakim, H., Khalid, H., Al-Fityani, L., ... & Ayman, A. (2019). Body mass index perception, body image dissatisfaction and their relations with weight-related behaviors among university students. *International journal of environmental research and public health*, *16*(9), 1541.

Ristevska-Dimitrovska, G., Stefanovski, P., Smichkoska, S., Raleva, M., & Dejanova, B. (2015). Depression and resilience in breast cancer patients. *J Maced Med Sci.*; 3:661–5.

Roksa, J., & Kinsley, P. (2019). The role of family support in facilitating academic success of low-income students. *Research in Higher Education*, *60*(4), 415-436.

Sadeghi, M., & Gholamrezaei, S. (2019). The effect of integrative approach logo therapy and hope therapy on the body image fear and social adjustment in the women with breast cancer. *Iranian Journal of Psychiatric Nursing*, *7*(1), 66-74.

Shatte, A. B., Hutchinson, D. M., & Teague, S. J. (2019). Machine learning in mental health: a scoping review of methods and applications. *Psychological medicine*, *49*(9), 1426-1448.

Sloan, S., Teti, M., & Benson, J. (2018). Redefining body image after breast cancer: A photovoice study. *Innovation in Aging*; *2*(Suppl 1): 275-276.

Solano, J. P. C., da Silva, A. G., Soares, I. A., Ashmawi, H. A., & Vieira, J. E. (2016). Resilience and hope during advanced disease: a pilot study with metastatic colorectal cancer patients. *BMC palliative care*, *15*(1), 70.

Spatuzzi, R., Vespa, A., Lorenzi, P., Miccinesi, G., Ricciuti, M., Cifarelli, W., et al. (2016). Evaluation of social support, quality of life, and body image in women with breast cancer. *Breast Care.*; 11:28–32.

Sun, L., Ang, E., Ang, W. H. D., & Lopez, V. (2018). Losing the breast: a metasynthesis of the impact in women breast cancer survivors. *Psych oncology 27*, 376–385.

Thompson, T., Pérez, M., Kreuter, M., Margenthaler, J., Colditz, G., & Jeffe, D. B. (2017). Perceived social support in African American breast cancer patients: Predictors and effects. Social Science & Medicine, 192, 134-142.

Todorov, N., Sherman, K. A., Kilby, C. J., & Breast Cancer Network A. (2019). Self-compassion and hope in the context of body image disturbance and distress in breast cancer survivors. *Psych oncology 28*, 2025–2032.

Turk, F., & Waller, G. (2020). Is self-compassion relevant to the pathology and treatment of eating and body image concerns? A systematic review and meta-analysis. *Clinical Psychology Review*, *79*, 101856.

Wang, J., Xu, B., Wang, W., Zhai, X., & Chen, X. (2018). Efficacy and safety of fulvestrant in postmenopausal patients with hormone receptor-positive advanced breast cancer: a systematic literature review and meta-analysis. *Breast Cancer Res Treat.*; 171:535–544.

Yang, J. H., & Kim, O. S. (2016). The structural equation model on resilience of breast cancer patients receiving chemotherapy. *J. Korean Acad. Nurs. 46*, 327–337.

Zalta, A. K., Tirone, V., Orlowska, D., Blais, R. K., Lofgreen, A., Klassen, B., ... & Dent, A. L. (2021). Examining moderators of the relationship between social support and self-reported PTSD symptoms: A meta-analysis. *Psychological bulletin*, *147*(1), 33.

Zhang, Z., Xie, Q., He, D., Ling, Y., Li, Y., Li, J., & Zhang, H. (2018). Circular RNA: new star, new hope in cancer. *BMC cancer*, *18*(1), 1-10.

Zhu, J., Fang, F., Sjölander, A., Fall, K., Adami, H.O., & Valdimarsdóttir, U. (2017). First-onset mental disorders after cancer diagnosis and cancerspecific mortality: a nationwide cohort study. *Ann Oncol*; *28(8):* 1964–9.