Investigating the Predictive Contribution of Attitude Towards Life and Belief System on Self-Resilience and Psychological Toughness of Cancer Patients About the Mediating Role of Emotion Regulation

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Abstract— The purpose of the present study was to investigate the predictive contribution of attitude to life and belief system on self-resilience and psychological toughness of cancer patients about the mediating role of emotion regulation. The current research is fundamental in terms of its purpose and descriptive of correlation type in terms of method. The statistical population consists of all cancer patients of Shahinshahr city. The sample size was 150 people based on Cochran's formula and the country's corona situation. The sampling method of the current research is available. This research used tools of attitude to life, belief system, self-resilience, psychological toughness, and emotion regulation, all of which had acceptable reliability and validity. The research data was done in two parts, descriptive and inferential, with the help of Excel, SPSS, and SmartPLS software. The results showed that the attitude towards life and the belief system with the role of mediating emotion regulation has a significant predictive ability on the self-resilience of cancer patients. Also, attitude towards life and belief systems with the role of mediating emotion regulation can predict the psychological toughness of cancer patients. In addition, emotional regulation has a significant relationship with self-resilience and psychological toughness. According to the research results, it can be concluded that the attitude towards life and the belief system mediating emotion regulation can predict cancer patients' resilience and psychological toughness. Also, the attitude toward life and the belief system directly impacts. In addition, attitude towards life has a direct positive relationship with psychological toughness.

Keywords— *Attitude to life, belief system, resilience, psychological toughness, emotional regulation.*

I. INTRODUCTION

Cancer is the third cause of death in Iran. Every year, more than 20,000 people die of cancer in Iran [1]. On the other hand, with the increase in life expectancy and the increase in the percentage of old age in the country's population, the advancement of technology and the lifestyle moving away from a clean, healthy environment without industrial carcinogenic pollutants, the incidence of cancer is expected to double in the next two decades [2]. Undoubtedly, cancer is one of the most stressful events that people face in their lives. Usually, when faced with a cancer diagnosis, patients will experience a complex shock, and it will be very difficult for them to bear these conditions [3, 4]. Cancer patients always feel helpless in front of stressful and dangerous situations and experience

adverse effects in life. Resilience and psychological toughness are among the variables that can moderate life's tensions and adverse effects [5, 6]. One factor that can effectively improve the mental health of people with cancer is endurance. Resilience successfully adapts to adverse conditions [7, 8]. Improving endurance is an important goal for treatment and prevention. Resilience is a structure based on the approach based on strengths and indicates the ability of people to cope with problems and risks [9]. In other words, resilience positively adapts to adverse conditions [10]. It also protects the psychological impact of problematic events. Dovidov et al. (2010) believe that one of the people's most important and fundamental bases of mental health is their resilience level. Humans differ regarding internal strength, flexibility, and tolerance to problems [11]. Resilience is "a process, ability, or outcome of successful adaptation to threatening conditions" [12]. In other words, positive adaptation responds to adverse life conditions and is a form of self-repair with positive emotional, emotional, and cognitive consequences.

One of the variables given special attention in psychological terms in cancer patients today is psychological toughness. Hardiness is a stable personality construct consisting of three main components: commitment, control, and combativeness [13]. Toughness is a single structure that includes cognitive, emotional, and practical components, and in addition to having its fundamental role in maintaining the survival and continuity of the individual's generation, in the direction of enriching and enriching lives by providing the basis for growth and His excellence works [14]. Stubbornness as a character factor can increase a person's performance and mental health level despite experiencing stressful situations [15]. Psychological toughness is a shield against stress in various life situations [16] and activates active transformational coping strategies, determining stressful conditions instead of coping strategies. Regression (denial, avoidance) reduces the possibility of physical diseases related to stress, mental diseases, and behavioral and functional weaknesses [17] and has a significant effect on predicting psychological well-being [18] and also the success of people in employment choices [19]. According to Anzlicht et al. (2006), resilience and tenacity have a significant negative relationship with anxiety and depression, and resilient and tenacious people can positively affect all kinds of adverse effects [20].

Another variable that can be effective on cancer patients is the attitude toward life, which plays an essential role in improving the mental health of cancer patients with a mutual connection with resilience and psychological toughness [21]. Attitude towards life (meaning of life) is a broad concept. According to the definition, it is a specific structure derived from the individual's cognitive system [22]. The attitude towards life affects a person's choice of activities and goals and makes him enjoy a purposeful life with a sense of power and a sense of evolution [18]. Attitude towards life is described as having a sense of purpose and meaning in life (McBride et al., 1998). Researchers found that the attitude towards life creates physical and mental comfort in old age [23]. Some researchers also believe that finding an attitude to life (meaning in life) is related to physical and mental health. Studies conducted on cancer patients show that patients with a better sense of purpose in life had higher self-esteem, less anxiety and worry, and less social

dependence [5]. Breitbart et al. (2007) believe that suffering stimulates the need to understand the meaning. Patients facing chronic diseases like cancer tend to search for a purpose. He adds that the group with a better attitude towards life is more successful in emotional, psychological, and social adaptation to this disease.

Another variable that can play an important role in cancer patients is the belief system. beliefs; It is a belief and ideological system with a set of principles that help a person to interpret his daily reality. Belief systems are stories we tell ourselves to define our personal sense of reality. Every human has a belief system that he uses and it is through this mechanism that he feels the world around him individually. Perceived reality is created using the system of signs and is influenced by belief systems; Therefore, it can affect a person's response to surrounding events. The belief system, which has components such as self-belief, religious beliefs, and positive thinking, facilitates coping with problems. People who believe that they can overcome problems, have an internal source of control, consider themselves connected to supernatural forces and give them religious meanings, and have a positive view of challenges, consider them transitory or led they know maturity, and they have an optimistic writing style and a good sense of humor, they endure hardships more than others. Walsh (2015) believes about the importance of the belief system that adapting to crises and hardships depends on their conceptualization [10]. According to his belief, beliefs are a range of values, beliefs, attitudes and assumptions, the combination of which forms the framework of the basic assumptions of the family and forms the basis of emotional responses, decisions, and actions. Emotion regulation can be mentioned among other variables that affect cancer patients' resilience and psychological toughness—being aware of emotions and understanding them, accepting them, being able to control impulsive behaviors and behaving by desired goals to achieve personal goals and respect environmental demands. Emotion regulation is further investigated in two frameworks: re-evaluation and suppression [24], 1) strategies that are activated before creating emotions, prevent the occurrence of extreme emotions and cause interpretation and interpret the situation; in such a way that they reduce the emotional response related to that situation (reappraisal), 2) strategies that are activated after the emotion is found and are called inhibition (suppression or suppression) [25]. Seifi and Farzin Rad (2015) showed that emotion regulation has a positive and significant relationship with resilience and can predict 41% of resilience. The data indicate that good emotional regulation improves resilience in dealing with the diagnosis and medical treatment of breast cancer, and women with positive mental flexibility in the face of surgical and drug treatments have resilience. They improve their performance because they mentally focus on medical treatments and recovery periods [26]. Other studies have also observed the inverse relationship between resilience and emotional disorders.

II. MATERIALS AND DATASET

This research is fundamental in terms of purpose and correlational in terms of descriptive method. According to the entry criteria, the subjects were selected for this research. Then the subjects completed the consent form, the questionnaire was given to the cancer patients, and after one hour, the questionnaire

was collected. The resulting data were based on Structural equations that were analyzed. The statistical population consisted of all cancer patients of ShahinShahr city, almost 600 people. The sample size was selected based on Cochran's formula and the country's corona situation. The sample size was 150 cancer patients. An available sampling method was used, and questionnaires were implemented and collected. Due to the corona situation, the researcher is looking for the most available people in the target society.

III. REASERCH METHODS

A. Life Attitude Questionnaire (LRI):

In this research, Battista and Almond (1973) value of life index was used to evaluate the meaningfulness of life. This test contains 28 items in a range of three options: I agree, I have no opinion, and I'm afraid I have to disagree. Research shows this index has favorable validity and reliability coefficients [27]. Nasiri and Jokar (2008) reported the reliability of this index using Cronbach's alpha method for the entire index of 0.85. In the present study, the total reliability of the index was obtained using Cronbach's alpha method of 0.83. Nasiri and Jokar (2008) used factor analysis using principal components with varimax rotation to check the validity of this index. The results of factor analysis confirmed the 3-factor structure of the tool and showed that this tool explains 0.39 of the variances.

B. Belief System Questionnaire (SBL-15-R):

Howland et al. (1998) prepared the Belief System Questionnaire to measure non-obvious religious beliefs and ideas. This test is a revised and abbreviated form of the R54SBI questionnaire, which, due to its length, has been shortened using the structural analysis method. The current form of the Belief System Questionnaire consists of 15 statements, and the subject must indicate his agreement or disagreement with each statement on a 4-point Likert scale. This tool consists of two sub-scales: the sub-scale of religious beliefs and practices, which includes ten statements and evaluates the level of participation in religious ceremonies and practices and belief in the existence of God, and the sub-scale of social support, which measures the level of support that a person receives. It measures what it receives from its religious group and has five expressions. A person's high score on this scale will indicate his religiousness. Howland has also reported the reliability of this questionnaire using the internal consistency method and the validity using convergent and discriminant validity.

C. Self-resilience questionnaire:

Kalahanen's self-resilience scale: This scale was first adapted by Kalahanen (1996) as a self-report scale for assessing resilience from the statements of the California Psychological Questionnaire (CPI) and was implemented on a sample of California graduate couples, whose results were correlated with the CPI statements [13]. Then, Block designed the self-resilience assessment scale by adapting the statements of the Minnesota Multilevel Personality Questionnaire (MMPI) (1951) and CPI. This scale consists of 14 statements that give answers on a 4-point Likert scale from 1 (does not apply at all), 2 (applies very little), 3 (applies sometimes), and 4 (applies mostly). Measures The sum of the scores obtained from the 14 statements is the individual's self-resilience score on this scale. A score of

0 to 10 indicates very low resilience, 11 to 22 low resilience, 23 to 34 uncertain resilience, 35 to 46 high resilience, and 47 to 56 very high resilience. The content validity of the questionnaire is reported as 0.77. In the research of Sadat Fazel and Yazdakhasi (2015), the scale's reliability was reported using Cronbach's alpha coefficient of 0.72 [22]. In the present study, the reliability of the scale was obtained with Cronbach's alpha coefficient of 0.97, which indicated the optimal reliability of the scale.

D. Ahvaz Psychological Toughness Questionnaire:

The Ahvaz Psychological Toughness Questionnaire was created by Kiamarthi, Najarian, and Mehrabizadeh Artman to prepare a scale to measure "psychological toughness" by analyzing factors on a sample of 523 female and male students at the Shahid Chamran University of Ahvaz [17]. This scale consists of 27 questions on a four-point Likert scale from (never = 0 to most of the time = 4). In this questionnaire, questions 6, 7, 10, 13, and 17 are scored reversely. The range of scores that can be obtained in this questionnaire is between 0 and 108, and a higher score indicates high psychological toughness in people. The overall internal consistency of the questionnaire questions using Cronbach's alpha is reported as 0.77. This amount is in the subscale. Commitment, control, and combativeness are 0.68, 0.83, and 0.70, respectively [23]. The content validity of the questionnaire in Najarian's study was reported as 0.75. In the present study, the internal consistency of the questionnaire questions for the whole test was obtained as 0.76.

E. Emotional regulation questionnaire:

Garnevsky and Kraij's (2006) emotional regulation questionnaire is a 36-item instrument that measures self-regulation strategies in response to threatening and stressful life events on a five-point scale from 1 (never) to Always Five measures the following nine subscales: self-blame, other-blame, rumination, catastrophizing, positive refocusing, planning refocusing, positive reappraisal, and broad perspective and acceptance [23]. A higher score indicates a person's greater use of that cognitive strategy. Cronbach's alpha coefficient for the subscales of this questionnaire has been reported in the range of 0.71 to 0.81, and the reliability coefficient of its subscales in the retest method with a time interval of 14 items has been reported in the range of 0.48 to 0.61. Self-regulation strategies can be considered along one dimension (cognitive coping) and divided into two types of coping strategies: more compromised (positively effective) and less compromised (negative/ineffective). Positive refocusing, focusing on planning, positive reevaluation of a broad view (less important), and acceptance of coping strategies are more compromised. Self-blame, other-blaming, rumination, and catastrophizing are less compromised. Validity and reliability: In Iran, the Cronbach's alpha coefficient for the subscales of this test is in the range of 0.62 to 0.91, as well as the reliability coefficient of these factors in a retest method with a time interval of one week between 0.75 and 0.88. have obtained the results of factor analysis using principal components have shown that the self-regulation questionnaire has a seven-factor structure that includes positive refocusing of planning, positive evaluation of a broad perspective, acceptance, blaming others, blaming oneself, rumination, and catastrophizing. The content validity of the emotional regulation questionnaire was evaluated based on the evaluation of eight psychological experts, and Kendall's

agreement coefficients for the subscales were calculated from 0.81 to 0.92 [28]. In Khodapanah et al.'s research (2016), Cronbach's alpha of negative (ineffective) strategies was 0.89.

IV. RESULT AND DISCUSSION

In the findings section, the research data analysis and the results extraction were discussed, including descriptive and inferential findings. First, the characteristics of the subjects and research variables are presented using descriptive statistical methods and demographic information. Then, the results of the research hypotheses were presented using inferential statistical tests. Table 1 includes demographic information related to age, education, employment, and gender, and the frequency and percentage of the subjects are presented. Table 2 includes scores related to the index of central tendency of the average and standard deviation of the research variables and Table 3 correlation coefficients of research variables (** Significance at the 0.01 level and * Significance at the 0.05 level).

TABLE I. THE AGE, EDUCATION, JOB AND GENDER STATUS OF THE PARTICIPANTS TO THE RESEARCH SCALES.

Individual profile	Time	Frequency	Percentage
Age	20-30 years	25	66.16
	30-40 years	36	24
	40-50 years	50	33.33
	50-60 years	39	26
Education	High school	51	34
	diploma	45	30
	Bachelor's degree	35	23.33
	Master's degree and above	19	12.66
Employment	employed	49	32.66
	Unemployed	101	67.33
Gender	Man	61	40.66
	Woman	89	59.33

TABLE II. MEAN AND STANDARD DEVIATION INDICES OF THE VARIABLES.

Variables	Average	Standard Deviation
Attitude to life	51.78	5.31
belief system	45.96	4.04
Resilience	41.49	4.02
Psychological toughness	72.78	5.68
Excitement regulation	90.10	11.16

TABLE III. CORRELATION COEFFICIENTS OF RESEARCH VARIABLES.

Variables	1	2	3	4	5
1- Attitude towards life	1				
2- Belief system	**0.531	1			
3- Resilience	*0.151	**0.678	1		
4- Psychological toughness	**0.344	*0.123	**0.234	1	
5-Emotional regulation	**0.226	*0.145	*0.135	**0.657	1

Before examining the causal relationships between the variables, their correlation was examined through the Pearson correlation coefficient (Table 3-4). According to the results obtained in Table 3, it was found that all the variables have a positive and significant correlation at the $p \geq 0.01$ level. To check the normality of the data by using the Shapiro-Wilk test, the results showed that the assumption of the normality of the data distribution is confirmed ($p < 0.05$).

In order to check the reliability, the combined reliability index was used, the results of which are shown in the table below. In the methodology of the structural equation model, the combined reliability coefficient is also used, and values higher than 0.7 for each structure indicate its appropriate reliability. The results of Table 4 showed that composite reliability was not significant in any of attitude to life, belief system, resilience, psychological toughness and emotional regulation.

TABLE IV. CALCULATING THE COMBINED RELIABILITY OF THE VARIABLES OF ATTITUDE TO LIFE, BELIEF SYSTEM, RESILIENCE, PSYCHOLOGICAL TOUGHNESS AND EMOTIONAL REGULATION.

Variable	Composite reliability
Attitude to life	0.902
belief system	0.716
Resilience	0.762
Psychological toughness	0.856
Emotion Regulation	0.939

Reliability check (internal consistency): In Figure 1, the factor loading of each indicator on the corresponding structure is reported. The acceptable factor loading for each variable is 0.14. The questions whose factor loading was less than 0.14 were removed. Investigating the diagnostic validity of AVE in the structural equation model, one of the types of validity that is used is the diagnostic validity that is calculated by Smart-pls software, in the sense that the indicators (indicators of each

structure) finally have a suitable separation in terms of Provide measurements compared to other structures in the model. In simpler words, each indicator should only measure its structure, and their combination should be such that all structures are well separated from each other. This process was characterized with the help of the average variance index extracted from AVE. The results of Table 5 showed that the variables of attitude to life, belief system, resilience, psychological toughness, and emotional regulation have an average extracted variance of AVE below 0.5. Table 6 shows that Cronbach's alpha of all variables is at an acceptable level.

TABLE V.   EXAMINING AVE VALUES FOR DIAGNOSTIC VALIDITY IN THE VARIABLES OF ATTITUDE TO LIFE, BELIEF SYSTEM, RESILIENCE, PSYCHOLOGICAL TOUGHNESS AND EMOTIONAL REGULATION..

Variables	AVE
Attitude to life	0.285
belief system	0.189
Resilience	0.203
Psychological toughness	0.363
Emotion Regulation	0.408

TABLE VI.   EXAMINING DIAGNOSTIC CRONBACH'S ALPHA VALUES IN THE VARIABLES OF ATTITUDE TO LIFE, BELIEF SYSTEM, RESILIENCE, PSYCHOLOGICAL TOUGHNESS AND EMOTIONAL REGULATION.

Variables	AVE
Attitude to life	0.89
belief system	0.71
Resilience	0.75
Psychological toughness	0.82

The results showed that the attitude towards life has significant predictive power on the resilience of cancer patients through the mediation of emotion regulation. Also, attitude towards life has a significant relationship with resilience. The present research results align with the results of Taylor and Qahi (2003) [29]. They suggest the possibility that the effects of stress are adjusted to a large extent with the help of meaning in life, and this is consistent with the theory of Labetsi (1999) that the development of schema considers positive things to overcome tension [30]. Also, the results showed that the belief system could significantly predict cancer patients' resilience through the mediation of emotion regulation.
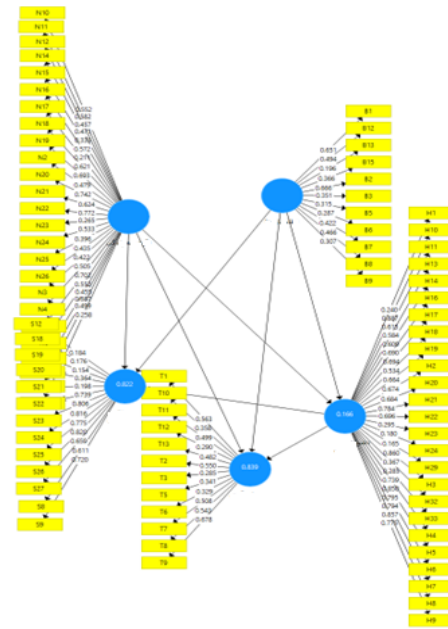

Fig. 1.   The final model and factorial questions of each variable.

The results of the present research are in line with the results of DiGiacomo et al. (2019) [26]. In explaining this finding, it can be said that considering the sensitivity of cancer disease and the important changes that occur in the field of beliefs and behavioral states during this period, the influence of religious beliefs on the control of negative emotions seems essential. . People who have stronger religious beliefs have better adaptability to stressful situations, and when faced with problems, they can identify problems faster than non-religious people and find better solutions for them; Also, they experience less negative emotions and depression, have less anxiety and have more resilience. In addition, the results showed that emotion regulation has a significant relationship with resilience. The present research results are in line with DiGiacomo et al. (2019) [26]. In the explanation of this finding, it can be argued that using emotional regulation in the context of stress may be effective in maintaining mental health, reducing negative emotions, and even increasing positive emotions through some strategies. Like positive reappraisal, it will result in increased resilience. Also, the results showed that emotion regulation has a significant relationship with psychological toughness. In explaining these findings, it can be pointed out that people with high emotional skills arrange their lifestyles in such a way that they experience fewer negative consequences and can show more psychological tenacity in the face of problems [31]. Also, people with high emotional skills are skilled in creating and maintaining high-quality relationships. On the contrary, people with low emotional regulation ability, in the face of life stress and adjustment, will have a weaker adaptation and, as a result, suffer more from depression, despair, and other negative consequences. In general, emotional regulation plays a key role in cancer patients, so people who are better able to use emotional regulation benefit from mental health and more self-confidence [32]. Therefore, emotion regulation can be effective on psychological toughness. By Increasing the data points the machine learning methods can be used, e.g., [33-44]. Therefore, the study on the perception to life and belief system on self-

resilience and psychological toughness of cancer patients about the mediating role of emotion regulation can be better investigated. Currently the sample size is limited to 150 people, which is not ideal for implementing the machine learning methods. However, in some cases, e.g., [45-55], the smaller sample cases and limited data had been also used for modeling the hydrological models. Application to medical and social sciences on the other hand needs more datapoints to fit a correct model. Methods, such as, LSTM, CNN and further deep learning methods in former studies, e.g., [56-66] need extensive datasets. Thus, expanding the datasets for future studies is fundamental. Setting up comparative analysis for various machine learning and deep learning methods, e.g., [67-72] would be the second priority for future research.

V. CONCLUSIONS

According to the research results, it can be concluded that the attitude towards life and the belief system, with the role of mediating emotion regulation, can predict cancer patients' resilience and psychological toughness. Also, attitude towards life and belief system directly affects resilience. In addition, attitude towards life has a direct positive relationship with psychological toughness. But the belief system does not directly affect psychological toughness. It seems that to increase the resilience and psychological toughness of cancer patients, in addition to paying attention to the attitude towards life and belief system, special attention should be paid to emotion regulation. It can also be concluded that the more beliefs and meaning in life increase in cancer patients, it can be effective on their resilience in dealing with cancer. In addition, attitude towards life and finding meaning in life can positively affect psychological toughness. But the belief system alone cannot be

effective on psychological toughness and requires the role of emotion regulation mediation to be effective on psychological toughness. Based on the results of the first hypothesis, to increase resilience and psychological toughness in cancer patients, attitude towards life can be used as a mediator of emotion regulation. Considering the direct relationship of attitude to life, positive results can be obtained by cultivating attitude to life and emotional regulation in cancer patients.

Based on the results of the second hypothesis, we can take help from the belief system with the mediating role of emotion regulation to increase resilience and psychological toughness in cancer patients. Therefore, by cultivating the system of religious beliefs and emotional regulation in cancer patients, it is possible to increase their resilience and psychological toughness so that they can go through the treatment stages more easily and go through better conditions in the stages of life. Based on the results of the third hypothesis, emotion regulation can be used to increase psychological resilience and toughness in cancer patients. Therefore, it can directly increase psychological resilience and toughness by cultivating emotion regulation in cancer patients. Non-random selection of the statistical samples of the research, the attitude of the statistical samples during the research towards the test and the uncertainty of the level of honesty and cooperation of the statistical sample to complete the questionnaires, the impossibility of generalizing the results to the whole society and other parts of the country. The limitation in the possibility of generalizing the results to other populations due to the special situation in the society and the use of available sampling makes it challenging to generalize the results.

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