Investigating the role of coping strategies, personality traits and mindfulness with self-care in leukemia patients

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ABSTRACT

Objective: Leukemia is one of the most common cancers, and several factors play a role in aggravating the disease process. The purpose of this study was to investigate the relationship between coping strategies, personality traits, and mindfulness with self-care in leukemia patients.

Materials and Methods: The research design was descriptive-correlation. The statistical population of the research included patients with leukemia in Shariati and Sina hospitals in Tehran in the second half of 2023. 250 people were selected by the convenience sampling method. The data were collected using the Coping with Stressful Situation Questionnaire (CISS), the Neo Five-Factor Personality Characteristics Questionnaire, the Freiburg Mindfulness Questionnaire Short Form (FMI-SF), and the Self-Efficacy Self-Care Questionnaire (SUPPH) and analyzed with a step-by-step regression test with SPSS software.

Findings: The results showed that the relationship between self-care and problem-oriented, emotion-oriented and avoidance strategies and the characteristics of extroversion, openness to experience, adaptability, conscientiousness and mindfulness has a significant positive relationship and a significant negative relationship with neuroticism. Also, the results showed that mindfulness, problem-oriented strategy, neuroticism, openness to experience and conscientiousness predict a total of 58% of the variance of self-care in patients with leukemia.

Conclusion: Considering the effect of problem-oriented strategy, neuroticism, openness to experience and conscientiousness in self-care, it is suggested to organize courses to improve self-care in order to improve psychological health and increase self-care in patients with leukemia.

Keywords: Coping strategy, leukemia, mindfulness, personality trait, self-care

1. Introduction

The increase in cancer prevalence in recent decades and its psychological impacts on human life have become a serious and difficult challenge for individuals (Hedayati et al., 2021). The Comprehensive National Cancer Network in 2010 defines cancer-related fatigue as "a feeling of tiredness or weariness related to cancer or cancer treatment that can appear as disturbing, persistent, and mentally disproportionate to the individual's current activity, causing disruption in the person's function" (Tabibzadeh, Soleimani, & Shiroudi, 2021). This disease is a type of disorder in the abnormal rate of cellular proliferation, which can occur in any tissue of the body at any age, leading to severe illness

and consequently death by attacking healthy body tissues (Halbert et al., 2020). Blood cancer, targeting white blood cells and causing rapid and uncontrolled proliferation of aberrant cells in the bone marrow, has devastating effects on the individual and their family (Tremolada et al., 2022), and is the second leading cause of death worldwide, causing 9.6 million deaths in 2018, with approximately 70% of deaths occurring in low- and middle-income countries (Anuk et al., 2019). Common symptoms of this disease include swollen lymph nodes, fever, frequent infections, abdominal swelling, and unexplained weight loss (Mousavi, Goodarzi, & Taghavi, 2020). Cancer is the primary cause of death in developed countries and, following heart disease, the second leading cause in developing countries (Kumari & Dubey, 2020).

According to the latest epidemiological studies in Iran, cancer is the third leading cause of death, claiming the lives of over 30,000 Iranians annually, with an estimated 70,000 new cases each year (Bajelan, Zadeh Mohammadi, & Ghorban Jahromi, 2022). Cancer affects the tolerance of difficult treatments and the resulting fatigue, physical, psychological, and social functioning, and the sense of disability in patients (Niazi et al., 2021). Approximately 40% of patients clinically exhibit significant psychiatric diseases, and 50% report considerable distress (Kumari & Dubey, 2020). Since the diagnosis and treatment of cancer are stress-inducing, coping strategies are used to positively influence physical and psychological health, control disease perception, and enhance disease understanding (Chen et al., 2023). Coping strategies are responses to threats or challenges to prevent or reduce distress, divided into active coping strategies (problem-focused and emotion-focused) and passive coping strategies (avoidance) (Ghanem, Samaha, & Nossair, 2019). The problem-focused style aims to solve the problem or issue, focusing on acquiring information about the problem that needs to be resolved. The emotion-focused style concentrates on emotions, and the passive style includes avoiding thinking about the threat or reassessing it without changing the stressful situations (Boatemaa Benson et al., 2020; Hosseini et al., 2023). The approach to illness depends on factors such as individual personality types, which significantly influence all behaviors and tendencies, causing various psychological and physical issues.

A model for classifying personality types is the NEO Five-Factor Personality Test, which introduces the five personality factors as extraversion, agreeableness, openness, conscientiousness, and neuroticism (Mosadegh, Darbani, &

Parsakia, 2023). Extraversion refers to the level of eagerness for excitement and talkativeness; agreeableness includes efforts to achieve consensus and approval from others; openness is the ability to adapt to events and cope with stressors; conscientiousness in this model is responsibility, goal-oriented, and organized behavior. Finally, neuroticism points to feelings of sadness, sensitivity, and irritability (Ansari, Haji-Gholami, & Moradi-Vastegani, 2021). Patients, upon showing disease symptoms and treatment side effects, believing in the fatality of cancer, often engage in anxiety-inducing rumination (Herzog et al., 2023). Mindfulness, which positively impacts the psychological health of individuals with cancer, is a new concept in psychology influenced by Eastern mysticism, with four main components: presence in the current moment, awareness and attention, cognitive processing, and behavioral change (Mir Ahmadi, Khezri Moghadam, & Rahmati, 2022). Mindfulness refers to the process of non-judgmental attention to internal and external events occurring at the moment (Marinovic & Hunter, 2022), and is positively correlated with psychological well-being (Abedini & Joibari, 2023). Cancer patients adopt self-care practices to improve their quality of life, reduce hospitalizations, and perform better in treatment (Moghadari Koosha et al., 2022). Self-care refers to an individual's perception and belief in their ability to care for themselves (Tabibzadeh, Soleimani, & Shiroudi, 2021) and includes behaviors for a healthy, successful life, and feelings of joy and vitality (Chin et al., 2021). Self-care plays a significant role in reducing disease complications in patients and preventing illness in healthy individuals (Soleymany & Sarifi, 2023). Therefore, self-care enhances health and includes physical activities, stress management, and interpersonal communications in cancer patients (Mousavi, Goodarzi, & Taghavi, 2020).

Research shows that coping strategies for cancer play a significant role in reducing patient anxiety and worry (Krasne et al., 2022). Also, a study found that personality traits significantly relate to the choice of emotional strategies, with the types of strategies depending on the dominant personality traits in the individual (Hosseini et al., 2023). Research indicates that increased disease perception and mindfulness are significantly related to reduced rumination in cancer patients (Torfiamidpoor et al., 2022). Studies examining self-care behaviors in cancer patients have shown that these behaviors directly relate to their quality of life and can reduce mortality (Hekmatpour, Nasiri, & Mohaghegh, 2019). A study indicated that self-care is significantly related to patient improvement, reduced fear,

increased motivation and confidence, and a sense of independence (Moghadari Koosha et al., 2022). A cross-sectional study on cancer patients revealed that coping strategies (high positive reappraisal, low rumination) are significantly related to their high mindfulness (Wang et al., 2022). Additionally, research on children with cancer stated a significant relationship between coping strategies and treatment response (self-care) during the clinical period (Tremolada et al., 2022). A study by Silsen et al. (2022) showed that mindfulness is negatively related to depression reduction and positively impacts cancer patient recovery. Research results indicate that having a psychological program in cancer patients is significantly related to self-care, increased efficiency, symptom improvement, and life quality (El-Jawahri et al., 2023).

Considering the discussed issues, various factors related to the daily lives of cancer patients influence self-care in these patients. The present research intends to investigate the relationship between coping strategies, personality traits, and mindfulness with self-care in blood cancer patients, to determine the contribution of each mentioned variable in improving self-care in these patients. Undoubtedly, research outcomes like this help in better understanding the factors affecting psychological problems in these patients, proposing suitable strategies for controlling and reducing the psychological consequences of cancer. The purpose of the current study is to investigate the relationship between coping strategies, personality traits, and mindfulness with self-care in blood cancer patients.

2. Methods and Materials

2.1. Study Design and Participants

The research method of the present study was descriptive-correlational. The population included all patients with blood cancer in Shariati and Sina hospitals in Tehran in the second half of the year 2023. A total of 250 individuals were selected using a convenience sampling method. The inclusion criteria for the study were: patient consent to participate in the research, being conscious and able to understand the questions, being over 20 years of age, and having a definitive cancer diagnosis; the exclusion criteria included: patient withdrawal of consent to continue and difficulty in continuing due to the condition of the disease. After providing explanations and obtaining consent, an online questionnaire link was sent to the participants for completion.

2.2. Measures

2.2.1. Coping Strategies

Coping Inventory for Stressful Situations (CISS) was developed by Endler and colleagues in 1990. The test covers three main areas of coping behaviors: problem-focused coping, emotion-focused coping, and avoidance coping. Endler and colleagues (1990) reported the reliability coefficient of this questionnaire on a sample of 313 individuals (161 women and 152 men) as 0.92 for problem-focused coping in boys and 0.90 in girls, 0.82 in boys and 0.85 in girls for emotion-focused coping, and 0.85 in boys and 0.82 in girls for avoidance coping (Chen et al., 2023; You et al., 2018).

2.2.2. Personality traits

The short form of the NEO Five-Factor Inventory was developed by McCrae and Costa in 1980. This questionnaire consists of 69 questions with a 5-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree) and assesses five personality traits: neuroticism, extraversion, openness, agreeableness, and conscientiousness, with 12 questions dedicated to each trait. The score range for each question is from 0 to 4, and the score for each personality trait varies from 0 to 48, with higher scores indicating a greater presence of that personality trait. They reported the reliability coefficient of the scale using internal consistency, Cronbach's alpha, as 0.68 to 0.83 and the validity coefficient as 0.75 to 0.83. In the standardization of its Persian version by Garoosi Farshi and colleagues, Cronbach's alpha was estimated to be from 0.56 to 0.87 (Ansari, Haji-Gholami, & Moradi-Vastegani, 2021; Costa Jr & McCrae, 1992).

2.2.3. Mindfulness

Freiburg Mindfulness Inventory Short Form (FMI-SF) consists of 10 items and two subscales of acceptance and presence, was created by Walach, Buchheld, and Schmidt in 2006. This questionnaire is designed on a 4-point Likert scale and scores range from 14 to 65. Walach and colleagues (2006) tested this questionnaire with three samples – a general population with mindfulness experience (α=0.86), a general population without mindfulness experience (α=0.79), and a clinical sample (α=0.86) – and observed good reliability. Ghasemi and colleagues (2015) examined the validity and reliability of this questionnaire in their research, reporting results with a Cronbach's alpha of 0.92 and a retest reliability coefficient of 0.83. This questionnaire

is a suitable tool with acceptable psychometric properties for measuring the level of mindfulness in the Iranian population (Abdul Kadir, Mohd, & Dimitrova, 2021; Mir Ahmadi, Khezri Moghadam, & Rahmati, 2022).

2.2.4. Self-care

Strategies Used by People to Promote Health (SUPPH) was originally designed by Lew in 1996 specifically for cancer patients and was translated into Persian by Azizi Fini. It consists of 29 five-option Likert-scale questions ranging from "completely confident" (5 points) to "slightly confident" (1 point). It includes four dimensions: "adaptation, stress reduction, decision-making, and enjoyment of life." The questionnaire questions assess the individual's confidence in performing self-care tasks, and the total score ranges from 29 to 145. This tool is self-reported and its internal consistency was reported using Cronbach's alpha as 0.94 (El-Jawahri et al., 2023; Soleymany & Sarifi, 2023).

2.3. Data analysis

The analytical method used in the present study included descriptive statistics (mean and standard deviation) and inferential statistics (Pearson correlation coefficient, hierarchical regression analysis). At the descriptive level, indices such as mean, standard deviation, minimum, and maximum scores were calculated, and at the explanatory level, hypotheses were tested using hierarchical regression analysis and Pearson correlation coefficient tests. The analysis tool in the present study was SPSS software version 26.

3. Findings and Results

The demographic characteristics results showed that the mean (standard deviation) age of the participants was 48.57 (16.86). To properly apply statistical tests, the normality assumption of the variables is first examined, which is done using the Kolmogorov-Smirnov test. The Table 1 presents the results of the mean, standard deviation, and Kolmogorov-Smirnov test.

Table 1

The results of mean, standard deviation (SD) and normality test (K-S)

Variable	Mean	SD	K-S (z)	P
Self-care	81.190	12.230	0.130	0.061
Problem-oriented	45.654	6.253	0.175	0.131
Emotion-oriented	29.369	4.359	0.171	0.089
Avoidant	27.004	4.235	0.160	0.092
Neuroticism	23.142	4.624	0.097	0.094
Extraversion	24.166	6.427	0.111	0.067
Openness to Experience	24.840	4.215	0.122	0.105
Agreeableness	24.801	4.215	0.120	0.083
Conscientiousness	25.551	3.816	0.145	0.053
Mindfulness	34.488	5.844	0.091	0.078

In the Kolmogorov-Smirnov test, if the significance level is greater than 0.05, the data distribution is considered normal.

According to the table, the assumption of normality of the data is approved.

Table 2

The results of VIF, tolerance and Pearson correlation test

Variable	VIF	Tolerance	Correlation with self-care	p
Self-care	-	-	1	0.000
Problem-oriented	2.999	0.333	0.366	0.005
Emotion-oriented	3.292	0.304	0.137	0.000
Avoidant	3.291	0.304	0.320	0.001
Neuroticism	1.282	0.780	-0.198	0.002
Extraversion	1.675	0.597	0.481	0.010

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Openness to Experience	1.296	0.771	0.432	0.005
Agreeableness	1.477	0.677	0.155	0.018
Conscientiousness	1.751	0.571	0.456	0.000
Mindfulness	1.770	0.565	0.625	0.000

As per Table 2, self-care has a significant positive relationship with problem-focused strategies (0.366), emotion-focused strategies (0.137), and avoidance strategies (0.320), and personality traits such as openness to experience (0.178), agreeableness (0.117), and conscientiousness (0.105). It has a significant inverse relationship with personality traits like neuroticism (-0.198), extraversion (-0.019), and mindfulness (-0.552). To detect multicollinearity, the variance inflation factor and tolerance coefficient are used. The variance inflation factor (VIF) for

each variable should not be more than 10. As observed in the table, the inflation coefficients are less than 10, confirming that no predictor variable is explained by other predictor variables. In terms of tolerance coefficient, all variables in the research have a tolerance coefficient higher than 0.10, indicating the absence of multicollinearity. Stepwise regression was used in this research. In stepwise regression, variables are entered into the model in order of their highest impact. The regression coefficients are reported in the Table 3:

Table 3

The summary of regression model

Model	Source	SS	df	MS	F	R	R^2	R^2_{adj}
1	Regression	13675.805	1	13675.805	148.866	0.612	0.375	0.373
	Residual	22782.851	248	91.866				
	Total	36458.656	249					
2	Regression	17083.466	2	8541.733	108.892	0.685	0.469	0.464
	Residual	19375.190	247	78.442				
	Total	36458.656	249					
3	Regression	19927.867	3	6642.622	98.851	0.739	0.547	0.541
	Residual	16530.789	246	67.198				
	Total	36458.656	381					
4	Regression	20937.528	4	5234.382	82.624	0.758	0.574	0.567
	Residual	15521.128	245	63.352				
	Total	36458.656	381					
5	Regression	21373.058	5	4274.612	69.139	0.766	0.586	0.578
	Residual	15085.598	244	61.826				
	Total	36458.656	381					

In Table 3, the first model includes mindfulness, the second model includes mindfulness and problem-focused strategy, the third model includes mindfulness, problem-focused strategy, and neuroticism, the fourth model includes mindfulness, problem-focused strategy, neuroticism, and openness to experience, and the fifth model includes mindfulness, problem-focused strategy, neuroticism, openness to experience, and conscientiousness. In the first model, mindfulness is entered and predicts 38 percent of the variance in self-care. In the second model, with the addition of problem-focused strategy, it predicts 47 percent of the variance in self-care. The third model, with the addition of

neuroticism, predicts 55 percent of the variance in self-care. In the fourth model, with the addition of openness to experience, it predicts 57 percent of the variance in self-care. In the fifth model, with the addition of conscientiousness, it predicts 58 percent of the variance in self-care.

Table 4

The results of step-wise regression analysis

Model		Non-standard coefficients		Standard coefficients	t	p
		B	SEM	Beta		
1	Constant	36.872	3.698		9.972	< 0.01
	Mindfulness	1.287	0.105	0.612	12.201	< 0.01
2	Constant	14.423	4.824		2.990	< 0.01
	Mindfulness	1.213	0.098	0.577	12.364	< 0.01
	Problem-oriented strategies	0.852	0.129	0.308	6.591	< 0.01
3	Constant	26.827	4.855		5.525	< 0.01
	Mindfulness	1.222	0.091	0.582	13.461	< 0.01
	Problem-oriented strategies	0.030	0.123	0.372	8.395	< 0.01
	Neuroticism	-0.783	0.120	-0.287	-6.506	< 0.01
4	Constant	17.241	5.291		3.259	< 0.01
	Mindfulness	1.076	0.095	0.512	11.264	< 0.01
	Problem-oriented strategies	1.002	0.119	0.362	8.399	< 0.01
	Neuroticism	-0.758	0.117	0.278	-6.479	< 0.01
	Openness to experience	0.597	0.149	-0.181	3.992	< 0.01
5	Constant	3.555	7.342		0.484	< 0.01
	Mindfulness	1.036	0.096	0.493	10.849	< 0.01
	Problem-oriented strategies	1.107	0.124	0.400	8.905	< 0.01
	Neuroticism	-0.629	0.125	-0.230	-5.016	< 0.01
	Openness to experience	0.603	0.148	0.183	4.081	< 0.01
	Conscientiousness	0.362	0.136	0.129	2.654	< 0.01

Considering Table 4 and also the significance level of less than 0.01, it can be inferred that with every unit increase in mindfulness, self-care, problem-focused strategy, openness to experience, and conscientiousness increase, while neuroticism decreases.

4. Discussion and Conclusion

The present research aimed to investigate the relationship between coping strategies, personality traits, and mindfulness on the self-care of blood cancer patients. Individuals show different reactions when coping with illness, depending on their personality. The findings of this study indicated that coping strategies and personality traits have a significant relationship with self-care in cancer patients. Patients with cancer, due to stress and psychological pressures, experience reduced personal, family, and social functions. The choice of coping strategies based on personality traits is related to reducing resilience in these individuals and improving performance with the emergence of self-care behaviors. The results are consistent with some previous studies (Aliche, 2023; Nisa & Rizvi, 2016; Walsh et al., 2022; You et al., 2018).

The analysis showed that personality traits such as extraversion, experience-seeking, and conscientiousness have a significant positive relationship with adaptive coping strategies and self-care. Individuals with these personality traits can contribute to better self-care outcomes (Nisa & Rizvi, 2016). Studies have shown that people who experience higher levels of personality factors like optimism employ more effective coping strategies, which are influential in arousing hope, combating illness, and providing more support in self-care behaviors. Additionally, individuals with the personality trait of neuroticism, choosing avoidance coping strategies, lead to reduced self-care and support during cancer illness. The relationship of problem-focused coping strategies significantly with personality traits like conscientiousness reduces negative psychological outcomes in self-care behaviors (You et al., 2018). Personality traits predict coping strategies, with individuals choosing their coping strategy based on their personality traits in dealing with illness (Aliche, 2023). In explaining the negative relationship of self-care with coping style, one can refer to characteristics of the coping style such as self-blaming as the primary cause of the problem or having a sense of guilt for the problems that occurred, which

is the opposite of self-care where the individual is aware of their capabilities, strives to obtain resources, and uses others' support resources well in managing challenging situations of the disease. Individuals with personality traits of extraversion, conscientiousness, and experience-seeking, by choosing problem-focused coping strategies, experience a better level of quality of life and mental health, leading to more self-care behaviors and social adaptation in the treatment process and improving these individuals in society and their living environment. Conversely, individuals with neuroticism, by choosing emotional and avoidance strategies, experience a lower level of quality of life, emotional and cognitive functioning, which is related to self-care behaviors.

In the present study, the relationship between mindfulness and self-care in cancer patients was significant. These results are in line with previous research (Aliche, 2023; Liu et al., 2021; Mehta et al., 2019). The results showed that mindfulness techniques are related to managing the adverse effects of treatment and symptoms of cancer progression, which leads to increased self-care behaviors during treatment (Mehta et al., 2019). Mindfulness is a mental state associated with being present in the moment and non-judgmentally aware of thoughts and feelings, leading to positive changes in the process of diagnosis and treatment of cancer (Liu et al., 2021). By focusing and positively reevaluating current states, it reduces negative feelings in cancer patients, providing insights about potential benefits in improving emotional well-being and disease management (Aliche, 2023). Mindfulness, due to creating physical relaxation and freedom from cognitive processing against periods of depression and anxiety, can help patients. Mindfulness might have different effects on positive and negative psychological outcomes due to awareness and focus on the present, and these outcomes are related to the coping strategies and personality traits of patients. A significant portion of cancer patients, with a judgmental attitude and less awareness of the disease, suffer more from severe psychological outcomes. Therefore, mindfulness helps in enhancing the reevaluation of the disease, understanding, and acceptance, especially in difficult times for individuals with cancer. This indicates that mindfulness can have effective self-care behaviors for cancer patients, especially those experiencing high stress. Mindfulness plays an important role in promoting self-care behaviors by fostering positive psychological organisms such as reevaluation and flexibility. These mechanisms have led to reduced distress, worry about disease recurrence, fear of the future, and overall stress management in improving the well-being of cancer patients. Thus, practicing mindfulness can aid in improving psychological well-being and self-care behaviors in cancer.

5. Limitations & Suggestions

Among the limitations of the present research are the small sample size and the restriction of the study to patients with blood cancer. The impact of cultural backgrounds on individuals' personality traits and their implementation in coping strategies were other limitations of this research. It is suggested that for generalization, research should be conducted with a larger sample size and in other areas of cancer, considering different cultural contexts and comparing these variables with non-patients, along with gender differentiation. In line with this research, specific guidelines for psychotherapy and clinical approach of doctors and relatives to cancer patients can be provided to improve patient cooperation with doctors and therapeutic processes.

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