Iranian Evolutionary Educational Psychology Journal
IEEPJ
University of Hormozgan
Online ISSN: 2588 - 4395
Homepage: https://ieepj.hormozgan.ac.ir

Effectiveness of Palliative Care on Death Anxiety, Self-Compassion, and Perceived Stress in Patients with Leukemia

Azar Azadian[1], Masoud Navidi Moghadam[2]✉, Ali Nejati[3]

1. PhD student in Health Psychology, Payam Noor University, International Branch, Tehran, Iran
2. Assistant Professor, Department of Psychology, Payam Noor University, Qom, Iran, m.navidi.m@pnu.ac.ir
3. PhD in Mathematics, Faculty of Islamic Azad University, Tafresh Branch, Markazi Province, Iran

Article Info

Article type:
Research Article

Article history:
Received 30 Mar. 2024
Received in revised form 14 Apr. 2024
Accepted 11 Jul. 2024
Published online 01 Dec. 2024

Keywords:
Palliative Care,
Death Anxiety,
Self-Compassion,
Perceived Stress,
Patients with Leukemia

ABSTRACT

Objective: The current investigation examined the efficacy of palliative care in alleviating death anxiety, enhancing self-compassion, and mitigating perceived stress among patients diagnosed with leukemia.

Methods: This study was executed following an experimental design that included both a control group and an experimental group across pre-test and post-test, involving 30 leukemia patients who sought treatment at Firoozgar Hospital in Tehran in 2024. Participants were chosen through a process of simple random sampling from individuals who fulfilled the established entry criteria for the study. Data pertinent to the research were amassed during two intervals: at the commencement of the study and upon conclusion of the intervention (specifically, at the end of the fourth week). The instruments utilized for the research comprised a death anxiety questionnaire, a self-compassion questionnaire, and a perceived stress questionnaire. The training protocol implemented in the study consisted of a comprehensive four-week program, delivered in the format of one-hour sessions occurring twice weekly.

Results: The findings of the study indicated a statistically significant difference between the groups regarding the dependent variables, with 52.1% of the variance attributable to the changes in these variables resulting from the applied intervention.

Conclusions: Consequently, it can be concluded that palliative care is effective in ameliorating death anxiety, fostering self-compassion, and alleviating perceived stress in patients with leukemia, thereby warranting its recommendation as a targeted intervention.

Cite this article: Azadian, A., Navidi Moghadam, M. & Nejati, A. (2024). Effectiveness of palliative care on death anxiety, self-compassion, and perceived stress in patients with leukemia. *Iranian Evolutionary Educational Psychology Journal*, 6 (4), 149-162.
DOI: https//doi.org/ 10.22034/6.4.149

Publisher: University of Hormozgan.
DOI: https// doi.org/ 10.22034/6.4.149

[DOI: 10.22034/6.4.149]

Introduction

Cancer represents a significant health concern of the contemporary era, ranking as the second foremost cause of mortality subsequent to cardiovascular ailments (Jani et al., 2014; Moeinvaziri et al., 2022). The presence of cancer is associated with diminished stress tolerance among patients (Panahi et al., 2019). Consequently, individuals with low resilience tend to perceive stressful circumstances as unmanageable, exhibit reduced contemplation of various alternatives, solutions, and therapeutic interventions, and harbor a pessimistic outlook regarding their own endeavors to ameliorate their condition, thereby resulting in heightened irritability, discomfort, anxiety, depression, and further reduced distress tolerance (Mamashli & Aloustani, 2019). Conversely, the process of cancer diagnosis and treatment constitutes a profoundly stressful and distressing ordeal. Stress can be characterized as an individual's response to a perceived threat, whether real or fictitious, that endangers their mental, physical, emotional, and spiritual well-being, subsequently eliciting a cascade of physiological adaptive responses and reactions. Stress is a universal phenomenon experienced by humans and animals alike, often serving as a crucial adaptive mechanism in the face of environmental challenges. From an evolutionary perspective, stress is not merely a psychological burden or physiological reaction, but a fundamental survival strategy that has been shaped over millions of years. Understanding stress through the lens of evolution provides insight into its role in facilitating survival, promoting adaptation, and contributing to fitness in a changing environment (Ellis & Del Giudice, 2019). Stress responses are deeply rooted in evolutionary biology. The stress response, often referred to as the "fight or flight" response, originated to help organisms deal with immediate threats to their survival, such as predators or natural disasters (Taborsky et al., 2022). This response involves the activation of the hypothalamic-pituitary-adrenal (HPA) axis and the release of stress hormones like cortisol and adrenaline, preparing the body for quick action by increasing heart rate, blood pressure, and energy mobilization (MacLeod et al., 2023). Stress also plays a critical role in development, particularly during early life stages. The concept of "biological embedding" suggests that stress experienced during critical periods of development can shape physiological and behavioral responses throughout life, a process that may confer advantages in certain environmental contexts (Cantor, 2009). The stress perceived as a consequence of this response is regarded as a potential threat to an individual's mental, physical, and emotional welfare, which triggers a sequence of

[DOI: 10.22034/6.4.149]

physiological responses and reactions in the individual affected (Li et al., 2016). Given that no individual is exempt from mortality and that every person will eventually confront the reality of death, this contemplation alone can instigate profound anxiety regarding life-threatening circumstances within any human being. Throughout their lifespan, individuals encounter varying intensities of death anxiety. This phenomenon is inherently more prevalent among those afflicted with incurable or challenging-to-treat conditions. Empirical evidence has indicated that the prevalence of death anxiety is notably higher in the context of difficult-to-treat diseases, such as cancer (Ellis et al., 2018).

Moreover, it has been established that individuals who endure adverse events, such as living with a chronic illness like cancer, typically exhibit increased unkindness and critical behavior towards themselves, which correlates to the experience of anger as a typical reaction upon realizing their health circumstances (Wong et al., 2011). During periods of adversity and negative occurrences such as cancer, self-compassion, defined as a constructive attitude towards oneself, can prove to be significantly beneficial and influential. Self-compassion entails that individuals extend the same kindness and consideration to themselves that they afford to others, even amidst personal hardships (Shahi -Senobari et al., 2021). This concept of self-compassion serves as an alternative to self-criticism and inflated self-esteem, comprising a three-dimensional construct characterized by self-kindness as opposed to self-judgment, recognition of shared humanity as opposed to isolation, and mindfulness as opposed to excessive identification (Feliu-Soler et al., 2017). Self-compassion may be conceptualized as a positive disposition towards oneself during adverse circumstances, functioning as a trait and a significant protective factor for personal development (Neff, 2023). Self-compassion may serve as a viable coping mechanism in response to personal adversity and setbacks, functioning primarily as a form of self-protection, facilitating an understanding of one's own mindset in conjunction with an acceptance of inherent limitations, and recognizing these elements as integral aspects of the human condition (Cleare et al., 2019). Empirical evidence indicates that individuals exhibiting higher levels of self-compassion report reduced incidences of depression, anxiety, and mental fatigue when confronted with challenging social contexts, and they demonstrate a greater likelihood of achieving success in such environments. Furthermore, these individuals tend to express greater satisfaction with their overall quality of life (Bluth et al., 2015).

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Caring for patients diagnosed with leukemia represents a multifaceted phenomenon influenced by a plethora of physical, cognitive, social, and environmental determinants (Wong et al., 2011).

As the disease advances toward its terminal stages, the prioritization of managing physical, psychological, and spiritual symptoms, along with the formulation of an advanced care plan, becomes paramount in care interventions (Diop et al., 2017). Palliative care embodies a multidisciplinary strategy aimed at addressing the needs of patients grappling with chronic illnesses, including leukemia. This approach emphasizes the enhancement of quality of life and the facilitation of a dignified and serene death (Dionne-Odom et al., 2014). Research findings have demonstrated that the implementation of palliative care in oncological settings contributes to enhanced symptom management, improved quality of life for both patients and their caregivers, increased overall well-being, decreased rates of hospital readmissions, and significant cost reductions (Wiskar et al., 2018). The obligation to provide care for these patients predominantly falls upon family members.

Despite the hospital's acceptance and provision of services for these patients, the availability of specialized services remains severely constrained. In recent years, the focus on palliative care has intensified in Iran due to the concerted efforts of the Cancer Research Network and associated institutions, alongside the backing of the Ministry of Health. Given the burgeoning array of activities and initiatives being implemented in Iran aimed at enhancing palliative care, particularly for cancer patients, it appears that the evolution and advancement of these programs is imminently attainable. Nevertheless, achieving the desired standards remains essential. The collaborative efforts and support required are extensive and multifaceted; however, significant challenges persist (Hosseini et al., 2022). Consequently, in light of the current landscape regarding the provision of these services within the country, the inquiry arises as to whether, prior to the establishment of comprehensive and systematic palliative care, the education of patients regarding the essential components of this care—particularly emphasizing the domains where their involvement is most crucial—can exert a beneficial influence on perceived stress, death anxiety, and self-compassion among individuals diagnosed with leukemia.

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Material and Methods

The current investigation was executed as a pilot study encompassing both a control group and an experimental group, implemented in pre-test and post-test design, involving 30 patients diagnosed with leukemia who sought treatment at Firoozgar Hospital in Tehran in 2024. Participants were selected utilizing a simple random sampling method from individuals who fulfilled the specified entry criteria for the study. In this research endeavor, the requisite sample size was meticulously calculated based on the correlation coefficient estimates derived from antecedent studies, while taking into account a confidence level of 95% and a statistical power of 0.8. Subsequent to the acquisition of informed consent, participants were assigned randomly to two groups of 15 utilizing a random number table. The inclusion criteria encompassed: individuals aged over 18 years, confirmed diagnosis of blood cancer, absence of recognized mental or psychiatric disorders, a willingness to voluntarily engage in the study, non-participation in other related educational programs, no specific incidents occurring prior to the study, absence of drug use, lack of any physical ailments other than blood cancer, and absence of sensory impairments such as visual or auditory deficits that could potentially hinder learning. The exclusion criteria included any unwillingness to persist in cooperation with the research and the occurrence of events that might adversely affect quality of life during the study period. Data collection for the study was executed at the initiation of the study and the conclusion of the intervention (at the end of the fourth week. The research instruments incorporated a checklist of clinical demographic characteristics, a death anxiety questionnaire, a self-compassion questionnaire, and a perceived stress questionnaire. The educational protocol for the study comprised a four-week training regimen conducted by the researchers, structured as one-hour instructional sessions occurring twice weekly at the hospital and on outpatient days.

Instruments

The Self-Compassion Scale: This scale is a 26-item assessment tool devised by Neff (2003) aimed at quantifying self-compassion. The items within the assessment are evaluated on a 5-point Likert scale, ranging from "almost never" (zero) to "almost always." The total score is calculated within a range from zero to 104. Certain items and subscales are reverse-scored, with elevated scores signifying enhanced levels of self-compassion. The scale's psychometric properties have been substantiated through international research studies. The correlation coefficient among the six

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dimensions of this scale and the overall measure of self-compassion has been validated at a significance level of 0.001. The study conducted by Khosravi (2013) further established that Cronbach's alpha for the self-compassion questionnaire is 0.81, a value that is acknowledged as indicative of satisfactory internal consistency among the questionnaire items. Confirmatory factor analysis was employed to assess the validity of the instrument, revealing that the factor loadings associated with all subscales and definitions were in alignment with the desired standards.

Perceived Stress Scale: The Perceived Stress Scale serves as a quantitative instrument designed to assess the extent of stressful life circumstances encountered by an individual. This scale was pioneered by Cohen (1994). It encompasses three distinct iterations, comprising 4, 10, and 14 items, each employed for the evaluation of general perceived stress experienced within the preceding month. The scale is adept at measuring cognitive and emotional responses concerning stress-inducing events, mechanisms of coping, psychological stress management, and the identification of stressors that have been encountered. Additionally, it has been utilized to investigate risk factors associated with conduct disorders and elucidates the dynamics of stressful interpersonal relationships. The instrument is comprised of a total of 14 inquiries. The Perceived Stress Scale delineates two subscales: a) The Negative Perception of Stress subscale, which encompasses items 1, 2, 3, 4, 11, 12, and 14. b) The Positive Perceived Stress subscale, which includes items 5, 6, 7, 8, 9, 10, and 13, scored in a reverse fashion. In three distinct studies, the Cronbach's alpha coefficient for this scale was reported as 0.84, 0.85, and 0.86 (Li et al., 2016). A study involving Japanese students yielded Cronbach's alpha coefficients of 0.88 for the original scale and 0.81 for the revised Japanese version. In this particular investigation, the reported Cronbach's alpha coefficient was 0.82.

Death Anxiety Scale: The Death Anxiety Scale (Templer, 1970) constitutes an evaluative tool specifically designed to quantify anxiety associated with death, and it is recognized as the most extensively utilized instrument of its nature. This scale is structured as a self-administered questionnaire comprising 15 items that necessitate true-false responses. Initially, participants were instructed to provide their personal demographic information, including gender, age, educational attainment, and familial status, before engaging with the statements, which they were advised to read attentively and determine which statement most accurately reflects their sentiments. They were informed that the objective of the assessment is to elucidate descriptive characteristics and

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dimensions, emphasizing that there are no definitive correct or incorrect responses; thus, participants were encouraged to respond with sincerity. Following a comprehensive elucidation of the questionnaire's purpose, the instrument was disseminated among the subjects, and the completed questionnaires were collected promptly upon the conclusion of the allotted time. Each response on this questionnaire was assigned a binary score of 1 or 0, contingent upon the nature of the answer given; specifically, a score of 1 is designated if the participant's response indicates the presence of death-related anxiety, whereas a score of 0 is assigned if the response signifies an absence of such anxiety. For instance, concerning the inquiry: Are you worried about death? A negative response indicates the nonexistence of anxiety within the individual, thereby resulting in a score of 0, while an affirmative response denotes the presence of death anxiety, yielding a score of 1. The Templer Death Anxiety Scale represents a standardized instrument that has been employed in a multitude of empirical investigations across the globe for the assessment of death anxiety; furthermore, it has undergone translation, factor analysis, and validation within the context of Iran. For instance, Rajabi and Bohrani (2002) conducted an analysis involving 138 students in Ahvaz in 2001, subsequently reporting an internal consistency coefficient of 0.73.

Palliative Care Protocol

The curriculum comprising the eight sessions was meticulously developed through a thorough review of the needs assessment studies pertinent to these patients, alongside established palliative care protocols and consultations with relevant specialists, which is delineated as follows:

1- Strategies aimed at facilitating the acceptance of blood cancer, encompassing treatments, the complications associated with the disease and its therapies, as well as the entitlement to receive comprehensive information regarding treatment options and the right to actively engage in decision-making pertaining to treatment.

2- An exploration of the concept of palliative care, its implementation both globally and within Iran, the pivotal role of the patient within this framework, strategies for optimizing the care experience in light of the prevailing circumstances in Iran, and an introduction to existing support and care systems and networks.

3- A discussion of pharmacological and non-pharmacological methodologies for the effective management of pain and fatigue.

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4- An examination of pharmacological and non-pharmacological strategies for alleviating anxiety, stress, depression, and sleep disorders.

5- An overview of pharmacological, nutritional, and lifestyle interventions conducive to health in the context of blood cancer.

6- An exploration of pharmacological and non-pharmacological techniques for addressing sexual dysfunctions.

7- An analysis of body image, the various factors influencing body image, self-acceptance and esteem, and the management of interpersonal relationships.

8- An investigation into approaches for fostering spiritual and psychological well-being.

Results

Table 1 delineates the descriptive statistics for the variables. Analysis of data indicated that the scores of the participants across all variables adhere to a normal distribution.

Table 1. Scores of the participants across all variables adhere to a normal distribution

Variable	Phase	Group			
		Experimental		Control	
		Mean	SD	Mean	SD
Death Anxiety	Pretest	236.44	3.66	25.89	3.26
	Posttest	21.35	3.12	25.35	2.92
Self-Compassion	Pretest	76.71	6.55	77.01	6.64
	Posttest	81.15	6.84	77.86	6.24
Self-Compassion	Pretest	46.91	5.11	46.82	6.43
	Posttest	41.25	5.33	46.15	6.04

A multivariate analysis of covariance (MANCOVA) was employed to evaluate the research hypothesis. Prior to the execution of MANCOVA, its underlying assumptions were meticulously examined and validated. The results of the MANCOVA are encapsulated in Table 2.

Table 2. Results of multivariate analysis of covariance (MANCOVA)

Test	Value	F	Hypothesis DF	Error DF	Eta	Power	P
Pillai’s trace	0.521	13.57	2	25	0.521	1	0.001
Wilks' lambda	0.479	13.57	2	25	0.521	1	0.001
Hotelling’s trace	1.086	13.57	2	25	0.521	1	0.001
Roy's largest root	1.086	13.57	2	25	0.521	1	0.001

[DOI: 10.22034/6.4.149]

As indicated in Table 2, all four statistical measures—namely the Pillai's trace ($P < 0.001$ and $F = 13.576$), Wilks' lambda ($P < 0.001$ and $F = 13.576$), Hotelling's trace ($P < 0.001$ and $F = 13.576$), and Roy's largest root ($P < 0.001$ and $F = 13.576$)—demonstrate statistical significance. Consequently, it is evident that a statistically significant disparity exists between the two groups concerning at least one of the dependent variables ($P < 0.001$). The eta squared coefficient indicates that the variance attributable to the differential impacts on the dependent variables is significant, with 52.10% of the variance being associated with the intergroup differences. As a result, the primary hypothesis of the investigation—that palliative care effectively ameliorates death anxiety, enhances self-compassion, and mitigates perceived stress in patients with leukemia—is substantiated. In order to analyze the differences with greater granularity, the ANCOVA test was conducted within the framework of the MANCOVA analysis, the findings of which are illustrated in Table 3.

Table 3. ANCOVA test within the framework of the MANCOVA analysis

	Dependent Variable	SS	DF	MS	F	P	Eta
Intervention	Death Anxiety	196.15	1.96	163.96	16.82	0.001	0.375
	Self-Compassion	85.40	1.96	71.38	7.32	0.001	0.207
	Perceived Stress	372.15	2	186.07	42.60	0.001	0.603

Based on the data presented in Table 3, the F statistics for each of the three variables exhibit significance ($p < 0.001$). Consequently, the implemented intervention, specifically palliative care, has demonstrated a substantial impact on the dependent variables.

Discussion

The statistical analysis pertaining to the primary hypothesis indicated that the variance observed between the cohorts regarding the dependent variables is statistically significant, with 52.1% of the variance attributable to alterations in the dependent variables as a result of intergroup differences. Consequently, the principal hypothesis of this investigation, which posits that palliative care effectively ameliorates death anxiety, self-compassion, and perceived stress amongst patients with leukemia, is substantiated. The outcomes derived from the primary hypothesis of this inquiry are consistent with the findings of Kiarasi et al. (2022), Zamanigharaghoosh et al. (2021), Borjali et al. (2022), Narimani and Eyni (2022), Rogers and Turner (2010) and Saini et al. (2016).

[DOI: 10.22034/6.4.149]

A significant psychological challenge faced by individuals diagnosed with breast cancer is stress, which serves as both a predisposing factor for the illness and a resultant effect of the diagnostic and therapeutic procedures, alongside the subsequent complications arising from the disease, potentially undermining the treatment and recuperation process (Zamanigharaghoosh et al., 2021). Furthermore, by targeting the mitochondria as the source of cellular energy production, there is an increase in free radicals that are implicated in the molecular mechanisms underlying cancer pathology.

In the aforementioned context, it can be articulated that since the primary emphasis of self-healing training lies in the identification and remediation of detrimental cellular memories—memories that, consciously or unconsciously, induce stress within the organism and have facilitated a transformation of cells into a defensive state—such memories have disrupted the balance of the autonomic system, inducing a state of fight-or-flight and resultant chaos. By acquiring techniques such as recollection, forgiveness, and the release of resentment, ceasing detrimental behaviors and rectifying maladaptive beliefs, modifying lifestyle choices and internal dialogues, mastering the management of both internal and external stressors, and employing healing codes, participants may achieve a restoration of equilibrium within their autonomic system, thereby mitigating the activation of the fight-or-flight response through the reduction of both categories of stress (Zamanigharaghoosh et al., 2021).

Among the limitations inherent to this study, it is noteworthy that the population examined consisted exclusively of patients with leukemia; thus, the implications of the findings cannot be extrapolated to other patient populations, and the limited sample size, particularly concerning the variables of anxiety and depression, necessitates a cautious interpretation of the results.

In conclusion, it is recommended that, whenever feasible, the development of palliative care-based protocols should not only encompass the overarching framework of the protocol but should also delineate specific strategies, techniques, and mechanisms aimed at fostering change.

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Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Islamic Azad University.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection and analysis. All authors contributed to the article and approved the submitted version.

Funding

The authors did (not) receive support from any organization for the submitted work.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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[DOI: 10.22034/6.4.149]