IPA
International Journal of Psychology
Vol. 19, No. 1, Winter & Spring, 2025
PP. 9-34

Iranian **P**sychological
Association

Effectiveness of Philosophy Education on Hopefulness and Cognitive Emotion Regulation in Adolescents with Cancer

Article Type: *Research Article*

Yasna Mirzakhani, MA
Master's graduate in Educational Psychology, Department of Psychology, Islamic Azad University, Arak Branch, Iran.

Masoomeh Khodadad, PhD
Department of English Language, Arak Branch, Islamic Azad University, Arak, Iran

Reyhaneh Sheykhan, PhD*
Department of Psychology, Arak Branch, Islamic Azad University, Arak, Iran
r.sheykhan@iau.ac.ir
ORCID: 0000-0003-1476-4952

Tooraj Sepahvand, PhD
Department of Psychology, Faculty of Humanities, Arak University, Arak, Iran

Received: 2025/05/27 Revised: 2025/08/20 Accepted: 2025/11/14
Doi: 10.61882/ijpb.19.1.9

Cancer imposes considerable psychological distress on adolescents, highlighting the need for interventions that foster resilience and adaptive coping. This study aimed to evaluate the effectiveness of philosophy education in enhancing hope and cognitive emotion regulation among adolescents with cancer. A quasi-experimental design with a pretest–posttest format and control group was employed. The study population comprised all adolescents with cancer receiving treatment at Amirkabir Hospital in Arak during the spring of 203524. Using purposive sampling, 40 adolescents aged 15–18 years were selected and randomly assigned to experimental and control groups (n = 20 per group). Research instruments included the Snyder Hope Scale (1991) and the Cognitive Emotion Regulation Questionnaire (Garnefski et al., 2001). The experimental

group received 12 training sessions based on *Philosophical Inquiry for Children: A Teacher's Guide* (Cam, 1993) and *Stories for Thinking* (Fisher, 1996). Data were analyzed using analysis of covariance (ANCOVA) in SPSS-24. The results indicated that, after controlling for pretest effects, participants in the experimental group reported significantly higher levels of hope and greater use of adaptive emotion regulation strategies compared to the control group ($p < .05$). These findings suggest that philosophy education can be an effective non-pharmacological intervention for improving psychological well-being and adaptive coping in adolescents with cancer.

Keywords: hopefulness, cognitive emotion regulation, philosophy education, and adolescents with cancer.

Cancer is one of the leading causes of death from non-communicable diseases in the world (World Health Organization, 2018). According to Iran's first national study on disease burden and injuries, cancer resulted in 66,204 deaths among children in the year 2003 (Shojaei et al., 2019). The prevalence of cancer is equal in both genders during prepuberty, but in adolescence, the female-to-male ratio increases to 2:1 (Kai et al., 2018). Recent epidemiological studies in Iran have shown that the incidence of cancer among children and adolescents is increasing and requires special attention. For example, between 2014 and 2018, the number of pediatric cases rose from 2,765 to 3,354, and the age-standardized incidence rate (ASR) for individuals aged 0–19 years was 119.6 per million (Jorjani et al., 2024). Therefore, addressing this issue is of great importance.

It should be noted that psychological distress, including anxiety, distress, depression, and hopelessness are natural emotional response for patients facing life-threatening illnesses, whether they are adults or children (Rosenbaum & Spiegel, 2023). Additionally, the diagnosis and treatment of cancer can

impose physical, psychological, and financial burdens on patients (Parushtham et al., 2013).

For example, in children with cancer, the negative effects of the disease, treatment, and hospitalization on mental health are evident (Rosenbaum & Spiegel, 2023). In contrast, positive psychological functions, such as hope, are positively correlated with health (Rasmussen et al., 2023). Rasmussen et al. (2023) in a study on hope and health behaviors, as well as specific health outcomes such as pain, cancer, and chronic diseases, showed that hope plays an important role in health.

Encouraging patients to maintain hope and avoid despair is a critical responsibility for medical staff (Segro & Lorensen, 2006). Therefore, it is not surprising that healthcare providers (including physicians, oncologists, palliative care doctors, nurses, and psychologists) are expected to preserve and even instill hope in their patients (Begley & Blackwood, 2000, as cited in Freire et al., 2015). Hope also has physical effects and can positively impact pain management and physical weakness by activating brain circuits and stimulating endorphin release, ultimately reducing pain (Satija et al., 2014).

Additionally, psychological studies indicate that cognitive emotion regulation is a significant factor in determining health, successful performance, and social interactions. It predicts both physical and mental health, as measured by indicators such as mental well-being, positive mood, effective coping mechanisms, and health-promoting behaviors (Jafari et al., 2017; Vante et al., 2018). Cognitive emotion regulation refers to an individual's cognitive processing when facing adverse and stressful events (Garnefski & Kraaij, 2006; Hasani et al., 2015). In response to stressful situations, individuals employ various strategies that can

be categorized into two groups: Positive strategies (positive refocusing, planning, positive reappraisal, and perspective-taking) and Negative strategies (self-blame, blaming others, rumination, catastrophizing, and acceptance) (Garnefski et al., 2009).

Due to the multiple effects that cancer can have on a patient's life, advanced oncology physicians (APs) need to incorporate both pharmacological and non-pharmacological management strategies into their care plans (Daniels, 2015).

Various psychological interventions have been used to improve the mental health of children and adolescents with cancer, including: Cognitive-behavioral therapy (CBT) (Hamedi et al., 2024), Play therapy (Duke, 2022), Acceptance and Commitment Therapy (ACT) and Spiritual Intelligence Training (Pourzamani, Ghamari & Hosseinian, 2024) and Schema therapy (Berdissen et al., 2020). However, Imiasieh and Ningxieh (2022) found, in their meta-analysis, that all interventions within the philosophy of care domain demonstrated effectiveness in trauma-informed care, which can be applied to patients—particularly children and the elderly—based on their specific conditions. Since human thoughts are the foundation of behavior, the way people think and reason is crucial. As a result, the best method for teaching cognitive errors is an educational approach specifically designed to train strong reasoning and thinking skills. Among such methods, Philosophy for Children (P4C) enables children to respond appropriately to new situations and shape their behavior in line with future goals (Rezaei, Padervand, Sobhani & Rezaei, 2018), making it potentially beneficial for children and adolescents with cancer. This therapeutic approach helps children and adolescents develop cognitive and social skills (Malbioff-

Hortebis et al., 2021) and aims to have a positive and meaningful impact on their thinking abilities (Anal & Gans, 2024). The Philosophy for Children (P4C) program was first introduced by Lipman in 1969 (Zulkifli & Hashim, 2020). This program encourages children to explore topics that engage their minds, helping them to express their thoughts and emotions with confidence among their peers, defend their ideas, critique others, and be receptive to criticism. It also fosters acceptance of reality, problem-solving strategies, and self-improvement (Kabiri et al., 2020). The P4C program seeks to create an environment where children can think freely, develop intellectual independence and emotional autonomy, and ultimately enhance their mental well-being (Malbioff-Hortebis et al., 2018). Cancer in adolescents often refers to those who develop cancer between the ages of 9 and 15. Cancer in adolescents is not common, but a wide range of cancers can occur in this age group, and treating these cancers can be challenging for several reasons (www.cancer.org 2014). So the present study aimed to investigate the effectiveness of philosophy education on hopefulness and cognitive emotion regulation in adolescents with cancer.

Method

This study employed a quasi-experimental design with a pretest–posttest format and a control group. The experimental group received philosophy education, whereas the control group received no intervention or training. Participants were purposefully recruited from adolescents aged 15 to 18 who were undergoing cancer treatment at Amir Kabir Hospital in Arak during the spring of 2024. Subsequently, they were randomly assigned to two equal groups (experimental and control), with 20 participants in each group.

According to Delavar (2014), a minimum of 15 participants per group is required for experimental studies. Considering the potential dropout rate, 20 participants were enrolled in each group, resulting in a total sample of 40. An a priori power analysis was conducted with $\alpha = .05$ and a power of .80 to ensure that the sample size was adequate to detect statistically significant effects. Inclusion criteria for the study included: Participants were required to provide written informed consent alongside their parents, have received a confirmed cancer diagnosis at least six months prior, have undergone chemotherapy as the sole form of treatment, have no history of psychotherapy, and not be using psychiatric medications and exclusion criteria included: Participants were excluded if they missed more than two training sessions, experienced cancer recurrence, developed psychological problems, or were prescribed psychiatric medication.

Instrument

The Cognitive Emotion Regulation Questionnaire (CERQ) Developed by Garnefski et al. (2001), is an 18-item tool designed to assess cognitive emotion regulation strategies in response to threatening and stressful life events. It is scored on a five-point Likert scale, ranging from "Never" (1) to "Always" (5). The questionnaire evaluates nine subscales, categorized into maladaptive (negative) strategies and adaptive (positive) strategies: Maladaptive (negative) strategies: Rumination (focus on thoughts), Catastrophizing, Self-blame, and Other-blame. Adaptive (positive) strategies: Acceptance, Positive refocusing, Planning, Positive reappraisal, Perspective-taking.

Each subscale of this questionnaire consists of two items. The score range for negative strategies is 8 to 40, while for positive

strategies, it is 10 to 50. A higher score indicates greater use of that particular strategy by the individual. In the study by Garnefski & Kraaij (2006), the Cronbach's alpha reliability coefficients for positive strategies, negative strategies, and the overall questionnaire were .91, .87, and .93, respectively. In an Iranian cultural context, Yousefi (2006) assessed reliability in a sample of individuals aged 19-20 years, reporting a Cronbach's alpha of .82 for the entire questionnaire.

Additionally, the construct validity of the Cognitive Emotion Regulation Questionnaire was found to be satisfactory in an Italian sample (Balzarotti, John, & Gross, 2010). The construct validity of this questionnaire in Iran has been confirmed through confirmatory factor analysis (Abdi, 2007). Moreover, in Yousefi's (2006) study, validity was assessed by analyzing correlations between the total score and subscale scores, which ranged from .40 to .68 and were all statistically significant. In the present study, Cronbach's alpha was used to estimate the questionnaire's reliability. The values obtained for positive strategies, negative strategies, and the entire questionnaire were .77, .82, and .75, respectively, indicating acceptable reliability for this questionnaire in the research sample.

The Snyder Hope Scale

Developed by Snyder et al. (1991), consists of 12 questions and requires only a short time (approximately 2 to 5 minutes) to complete. The items are rated on a five-point Likert scale, ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). However, questions 3, 7, and 11 are reverse-scored. The total score for this scale ranges between 12 and 60. To obtain the overall score, the sum of all individual item scores is calculated. Higher scores

indicate greater hopefulness and a stronger sense of optimism about life in the respondent.

According to Snyder et al. (1991), the Cronbach's alpha for this scale ranges between .74 and .84, and its test-retest reliability over a ten-week period was found to be 0.80. In a study by Alaeddini (2008), the tool's reliability was assessed using Cronbach's alpha, yielding a value of 0.91. Additionally, Snyder et al. (1991) confirmed the validity of this scale through exploratory factor analysis and the two-factor model (Agency and Pathways). Alaeddini (2008) confirmed the instrument's validity in his research. In the present study, Cronbach's alpha was used to estimate the scale's reliability, yielding a value of .72, indicating acceptable reliability for the questionnaire in the research sample.

Summary of Philosophy for Children (P4C) Intervention Sessions

The educational materials used included the books Philosophical Inquiry for Children: A Teacher's Guide by Cam (1993, translated by Bagheri, 2012) and Stories for Thinking by Fisher (1996, translated by Shahri Langaroudi, 2013). These materials were implemented over 12 educational sessions, each lasting 60 minutes. Table 3-2 summarizes the Philosophy for Children (P4C) training sessions. Relevant topics were selected from chapters in Fisher (1996) and Kamm (1993) that most resonated with the emotional challenges of this age group and their illness. For example, the stories "What is Life?" and "Why Do We Suffer?" were included in the program to provide a platform for discussion of enduring hardship, the role of hope, and the meaning of suffering.

Table 1
Summary of Philosophy for Children (P4C) Training Sessions (Cam, 1993, translated by Bagheri, 2012; Fisher, 1996, translated by Shahri Langaroudi, 2013)

Sessions	Session Topics
First	Who Am I? (Cam's Mirror)
Second	Wants and Needs (How Much Land Does a Man Need?)
Third	Anger (The Story of Gelert)
Fourth	Bullying (The Encounter of Fingal)
Fifth	Courage and Fear (Princess Sana)
Sixth	Happiness (An Old Woman in a Vinegar Bottle)
Seventh	What is Life?
Eighth	The Bird's Nest
Ninth	Linda and Clara
Tenth	Gabriel's Story
Eleventh	Why Do We Suffer?
Twelfth	The Man Who Couldn't Control His Face

The study was approved by the university's ethics committee. Written informed consent was obtained from all participants and their parents. Participants were assured of confidentiality and their right to withdraw from the study at any time.

Results

In the present study, the experimental and control groups were tested across two phases: pre-test and post-test. Table 2 presents the mean, standard deviation, minimum, and maximum scores of the participants during the pre-test and post-test stages.

Table 2
Descriptive Statistics of Participants' Scores in Hopefulness and Cognitive Emotion Regulation in the Pre-Test and Post-Test Phases

	Variable	Group	n	Mean	Standard Deviation	Minimum	Maximum
Pre-Test	Negative Strategies	Experimental	20	23.90	4.56	18	36
		Control	20	23.70	4.94	15	34
	Positive Strategies	Experimental	20	26.25	5.26	17	34
		Control	20	26.55	4.99	19	36
	Hopefulness	Experimental	20	33.00	5.55	23	46
		Control	20	33.30	5.38	24	42
Post-Test	Negative Strategies	Experimental	20	21.80	4.26	15	33
		Control	20	23.75	4.59	16	33
	Positive Strategies	Experimental	20	28.94	4.86	19	36
		Control	20	26.54	4.98	20	38
	Hopefulness	Experimental	20	35.65	5.74	25	48
		Control	20	33.26	4.82	26	41

In Table 2, descriptive statistics of participants' scores are shown for hopefulness and cognitive emotion regulation in the pre-test and post-test phases.

First, to examine the normality of scores, the Kolmogorov-Smirnov test was used. The results indicated that the assumption of normality for positive strategies, negative strategies, and hopefulness was met at the $p < .05$ level.

Before analyzing the data related to the hypotheses, an examination was conducted to ensure that the data met the underlying assumptions of covariance analysis.

For this purpose, five assumptions of ANCOVA (Analysis of Covariance) were evaluated: Linearity[24], Multicollinearity[25], Homogeneity of the covariance matrix[26], Homogeneity of variances[27], Homogeneity of regression slopes[28]. Based on this analysis, the assumption of linearity between the pre-test and

post-test scores for positive strategies, negative strategies, and hopefulness was confirmed using a scatter plot.

Additionally, when the covariates have a high correlation (r = .90), the condition known as multicollinearity arises. In this study, the pre-tests for negative strategies, positive strategies, and hopefulness were considered as covariates. The pre-test correlations indicated that the assumption of multicollinearity among the research variables (covariates) was met. Additionally, before analyzing the data, Levene's test was used to examine the homogeneity of variance of the variables.

Moreover, Box's M test was conducted to assess the equality of covariance matrices between the two groups. The results of Box's M test and Levene's test are presented in Table 3.

Table 3
Results of Box's M Test and Levene's Test

Dependent Variable	Box's M	df1	df2	F	p
Negative Strategies	F=.84	1	38	3.97	.053
Positive Strategies	P= .532	1	38	2.01	.164
Hopefulness		1	38	.84	.363

The results presented in Table 3 indicate that Levene's test for negative strategies, positive strategies, and hopefulness was not significant. Therefore, the error variance in the post-test scores of the experimental and control groups is not significantly different, confirming the assumption of homogeneity of variances. Although the p-value (0.053) for negative strategies is close to the significance level and can be an indication of the possibility of heterogeneity of variances, considering that determining the significance level of .05 or .01 is a statistical convention that is

the basis for deciding whether to reject or confirm a research hypothesis in all scientific research, the assumption of no difference between variances is accepted here as well.

Additionally, Box's M test was conducted to assess the homogeneity of the covariance matrix. Given its non-significance in this study ($p \geq .532$, $F = .84$), this assumption was also met. Moreover, the regression lines' slopes between the covariates (pre-test scores for negative strategies, positive strategies, and hopefulness) and the dependent variable (post-test scores for negative strategies, positive strategies, and hopefulness) were equal across factor levels (experimental and control groups). Therefore, the assumption of homogeneity of regression slopes for pre-test and post-test scores on negative strategies, positive strategies, and hopefulness across the experimental and control groups was confirmed.

To examine the effect of the experimental intervention and test the research hypothesis, Multivariate Analysis of Covariance (MANCOVA) and Univariate Analysis of Covariance (ANCOVA) were conducted on the post-test scores of the groups, while controlling for the pre-test scores of the dependent research variables (negative strategies, positive strategies, and hopefulness). Table 4 presents the results of a MANCOVA applied to the post-test scores of the research variables (negative strategies, positive strategies, and hopefulness), controlling for their pre-test scores.

Table 4

Results of Multivariate Analysis of Covariance (MANCOVA) for Comparing Post-Test Scores of Research Variables Between Experimental and Control Groups

Test	Value	F	df (Hypothesis)	df (Error)	p
Pillai's Trace	.89	94.95	3	33	.001
Wilks' Lambda	.10	94.95	3	33	.001
Hotelling's Trace	8.63	94.95	3	33	.001
Largest Root	8.63	94.95	3	33	.001

The contents of Table 4 indicate that, after controlling for the effects of the pre-test, there is a significant difference in liner composition of dependent variables (negative strategies, positive strategies, and hopefulness) between the experimental and control groups (Pillai's Trace= .89, F= 94.95, P= .001). Next, univariate analysis of covariance (ANCOVA) was performed on the post-test scores, controlling for the pre-test scores of the dependent variables (negative strategies, positive strategies, and hopefulness) separately. The results of this analysis are presented in Table 5.

Table 5

Between-Group Results for Comparing Post-Test Scores of Research Variables in Experimental and Control Groups

	Source of Effect	Sum of Squares	df	Mean Squares	F	p	Effect Size	Test Power
Group	Negative Strategies	45.55	1	45.55	67.80	.001	.66	1
	Positive Strategies	72.13	1	72.13	47.42	.001	.57	1
	Hopefulness	71.86	1	71.86	54.57	.001	.60	1
Error	Negative Strategies	23.51	35	.67				

	Positive Strategies	53.33	35	1.52
	Hopefulness	46.08	35	1.31
Total	Negative Strategies	21533	40	
	Positive Strategies	31788	40	
	Hopefulness	48598	40	

The results presented in Table 5 indicate that the one-way ANCOVA for negative strategies (F = 67.80, p =.001), positive strategies (F = 47.42, p = .001), and hopefulness (F = 54.57, p = .001) is statistically significant. Referring to the descriptive results in table 2 and the effect size in table 5, indicated that the experimental group showed fewer negative strategies (means: 21.80 for E group vs 23.75 for C group, with effect size= .66), more positive strategies (means: 28.94 for E group vs 26.54 for C group, with effect size= .57), and more hopefulness (means: 35.65 for E group vs 33.26 for C group, with effect size= .60) compared to the control group. Therefore, philosophy education has had a positive impact on hopefulness and cognitive emotion regulation in adolescents with cancer. Despite these results, there may be limitations to the very high reported power in behavioral research, and it is suggested that future validation be conducted with larger samples in the same researches.

Discussion

This study aimed to determine the effectiveness of philosophy education on hopefulness and cognitive emotion regulation in adolescents with cancer. As the results indicated, there was a difference in post-test hopefulness scores, controlling for pre-test scores. This finding is consistent with the results of studies by Anal & Gans (2024), Payandehfar & Lasani (2015),

Cheraghzadeh et al. (2019), and Mousavi-Moeid (2019). The philosophy education program not only provides children with the opportunity to explore and practice cognitive and perceptual abilities, but also lays a foundation for discovering and developing values and ideals they consider important and worthy of respect. These classes and training sessions offer an environment where children can achieve emotional and social growth alongside cognitive development. In such a setting, students with cancer experience authentic dialogue, respect for others' opinions, growing mutual trust, and the ability to communicate at various levels. As a result, participation in a space where children's beliefs are respected and they are given the chance to ask questions helps them develop self-confidence and greater courage to express themselves (Qaedi, 2008). In this approach, children not only learn to respect their own beliefs and opinions, but also to respect others' beliefs and opinions, listen attentively, avoid mocking ideas, and view differences in perspective positively rather than adopting negative stances. Ultimately, this leads to healthier and more effective communication with the world around them.

The result of all these factors is the development of positive relationships and empathy, which enhances adolescent's hopefulness (Lipman, 2003). The Philosophy program provides an engaging, exploratory opportunity to explore topics that capture children's curiosity. This education not only cultivates critical thinking and deep reflection, but also fosters reflective thinking, collaborative reasoning, confidence in generating and developing ideas, and moral responsibility. Moreover, it helps prevent feelings of inadequacy (Hedayati, 2010), ultimately leading to greater hopefulness in children. The primary goal of

the philosophy education program is to enhance children's and adolescents' thinking skills so that they are prepared to handle life's challenges both in childhood and adulthood, utilizing higher-level cognitive skills. Philosophy, in the sense of thinking philosophically in an informal and enjoyable framework, serves as a means to strengthen the connection between the amygdala and neocortex in the brain. If individuals can explore, recognize, and discuss their problems, they can take steps toward hopefulness. The philosophy education program, by emphasizing peer discussion and mindful debate, leads to positive outcomes, such as increased hopefulness (Kalantari et al., 2013).

Furthermore, the findings indicated that philosophy education is effective in cognitive emotion regulation. This result is consistent with the findings of Mazarzehi (2022), Nejatifar et al. (2020), Fathi-Azar et al. (2019), Arda Tenkdemir et al. (2022), and Hooverl et al. (2017).

Philosophy for children and adolescents is a form of applied philosophy, but not in the sense of using various philosophers' opinions to formulate methods or solve non-philosophical issues. Instead, its goal is to encourage students to think philosophically and engage in philosophical activities (Hashemzadeh, Saberi & Ali, 2019). The philosophical thinking education program has clear cognitive objectives, compelling the mind into action through challenges, principled reasoning, and structured interaction (Brahman & Khodabakhshi Sadeghabadi, 2017). Philosophical education, by presenting individuals with various situations, provides them with broader information about the available options ahead. It seems that flexibility is directly related to such insights gained from these educational experiences. Teaching philosophy can also reduce the complexities of reality

by simplifying events for individuals. This approach transforms a person's perspective from one-dimensional to multidimensional, encourages diverse learning methods, and enables reassessment of strategies when facing obstacles (Zulkifli & Hashim, 2020). As a result, it can reduce reliance on negative emotion regulation strategies. Research has shown that philosophy education improves emotional self-regulation, social skills, and academic self-efficacy (Jamal Hoshiyar Langaroudi, 2024; Kidd, 2018). In the Philosophy for Children and Adolescents program, social interaction during philosophical discussions fosters socialization and develops sound judgment in young learners (Faraji, Makoundi, Bakhtiarpour, Eftekhari Sa'adi & Ehteshamzadeh, 2019). Overall, philosophy education provides students with an active, inquisitive role in making fundamental changes not only in the cognitive domain but also in other non-cognitive domains, empowering children and adolescents to solve personal and social challenges (Satari, 2014). This multi-dimensional approach is highly effective in reducing the use of negative emotion regulation strategies.

In philosophy education for children and adolescents, the skills of living, thinking, and reasoning in different dimensions, questioning ideas, and evaluating thoughts independently of their sources are emphasized (Ramezani, 2010). This process empowers individuals to face life's challenges (Naghdali & Panahi, 2011).

The Philosophy for Children and Adolescents teaching method leads to: Improved problem-solving abilities, enhanced social problem-solving and its components, increased critical thinking, strengthened logical thinking and reasoning skills, Greater self-awareness and understanding of the surrounding world, improved

moral judgment development, boosted self-awareness and self-efficacy, heightened optimism, motivation, and active engagement. Additionally, anger and its components, stemming from frustration with self-expression and insufficient reasoning abilities, are reduced (Tajallinia & Karimi, 2014). In the Community of Inquiry, children and adolescents think and converse together, agreeing and disagreeing through reasoning. Each individual can adjust their opinions by the end of the session or maintain their stance, reflecting their independence and the respect for their autonomy throughout the discussions. This method increases motivation and engagement, which is crucial for their well-being, as children and adolescents with cancer tend to be passive (Sadock, Sadock & Ruiz, 2015, translated by Ganji, 2022). This thought-provoking and friendly space, where listening to children's voices is valued, enhances their reasoning and judgment abilities. Through collective dialogues, it strengthens argumentative and logical thinking, impacting the cognitive strategies of children and adolescents with cancer (Hedayati, 2011).

The present study had certain limitations. One key constraint was the reliance on self-report tools to measure the target variables, which may have led to less precise data collection. Additionally, in the analyses, factors such as cancer type, socio-economic status, and family history of illness were not controlled. Furthermore, the study lacked a follow-up phase that could have provided longer-term insights.

Acknowledgments

The authors would like to express their appreciation for the collaboration of all participants in the present study.

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