Original Article
2025, 15(2): 7-17
DOI: 10.22038/EBCJ.2025.84840.3078

Received: 02/01/2025
Accept & ePublished: 11/05/2025

Evidence Based Care Journal
http://ebcj.mums.ac.ir
Online ISSN: 2008-370X

A Care Program Based on Watson's Theory of Human Caring and its Effect on Death Anxiety and Hope for Life in Cancer Patients: A Randomized Clinical Trial

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Abstract

Background: Cancers are the second leading cause of death worldwide, adversely affecting patients' well-being including hope for life, and cause death anxiety.

Aim: This study was conducted with aim to investigate the effect of a nursing care program based on Watson's Theory of Human Caring on death anxiety and hope for life in cancer patients.

Method: This single-blind randomized clinical trial was conducted on 64 cancer patients who met the inclusion criteria at IranMehr Oncology Hospital of Birjand in 2024. Participants were divided into the intervention and control groups. The intervention group underwent an eight-week program based on Jean Watson's nursing theory including four stages, while the control group only received the routine nursing care. Data were collected using the validated and reliable Death Anxiety Scale and Adult Hope Scale and demographic and clinical data collection form. $p<0.05$ was considered statistically significant.

Results: There was no significant difference between the intervention and control groups in the mean scores of death anxiety and hope for life before the study ($p>0.05$). However, after care based on Watson's Theory of Human Caring, statistically significant reduction was observed in the mean score of death anxiety and also an elevation in hope for life in the intervention group compared to the control group ($p<0.05$).

Implications for Practice: Proper intervention in severely ill or poor prognosis patients provided by healthcare professionals can have a positive impact on patients' outcome and improve their quality of life.

Keywords: Anxiety, Cancer, Hope, Nursing practice, Terminal care

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Introduction

Cancer encompasses a wide range of diseases characterized by uncontrolled cell division and local tissue invasion (1) that is the second leading cause of death globally, following cardiovascular diseases, and is the third leading cause of mortality in Iran, accounting for 13% of deaths in the coming decade (2, 3). The incidence of cancer is increasing, making it one of the serious challenges in clinical medicine (4, 5). Global statistics for 2022 indicate that nearly 20 million new cancer cases and approximately 10 million cancer-related deaths are reported. Projections based on demographic trends suggest that the annual rate of new cancer cases will rise to 35 million by 2050, which is 77% higher than the 2022 statistics (6).

The diagnosis of cancer has a profound impact on patient well-being and often leads to decreased quality of life, increased anxiety, and a higher incidence of depression and hopelessness (7, 8). Awareness of a malignant disease can cause existential crises, altering an individual's understanding of life and triggering anticipatory anxiety about death (9). Death anxiety, defined as an irrational fear of death, represents as a significant psychological challenge among cancer patients (10). Studies have shown that the level of death anxiety is higher in cancer patients compared to other patient groups (11), which has negative effects on mental and physical health and overall quality of life (12).

Despite the emphasis on alleviating physical symptoms in the care of cancer patients, it is essential to address the psychological and social dimensions of the patient experience, including death anxiety. Since cancer patients are a vulnerable population, the consequences of death anxiety can exacerbate their challenges throughout treatment (13, 14). One of these challenges is the loss of hope for life, which can intensify feelings of hopelessness and depression, complicating their clinical course (15). Hope for life plays a vital role in coping with chronic illnesses and enables individuals to transcend their current situations; however, a cancer diagnosis can severely threaten patients' hope for life (16). Studies indicate that fostering hope for life is essential for successfully confronting the challenges posed by cancer (17, 18). The complexity of cancer as a life-altering diagnosis necessitates comprehensive, empathetic, and holistic nursing care. A humanistic approach to nursing, as articulated in Watson's Theory of Human Caring, emphasizes the interconnectedness of body, mind, and spirit in the healing process (19). This model promotes a caring relationship between nurses and patients, creating an environment conducive to healing and emotional support (20). The Caritas Processes, defined by Watson, provide a framework for delivering emotional, patient-centered care, focusing on enhancing the quality of life and mental health for cancer patients (21). Watson’s Theory of Human Caring developed by Jean Watson, emphasizes on the importance of humanistic and holistic care in the healing process. Watson argues that nursing is not just a clinical task but a deeply compassionate and interpersonal practice that enhances patients’ physical, emotional, and spiritual well-being. The theory is grounded in the concept of Carative Factors, later evolved into Caritas Processes, which promote love, kindness, and a transpersonal connection between nurses and patients 22). Through these caring interactions, nurses create a supportive and healing environment that fosters trust and emotional security.

Watson’s Theory of Human Caring is closely related to death anxiety and facilitating hope for life. Watson suggests that compassionate care can alleviate existential distress and fear of death by fostering a sense of connection and meaning. A caring relationship provides emotional reassurance, helping patients navigate their fears and uncertainties with greater resilience. Furthermore, by emphasizing hope and meaning, Watson highlights that nurses can instill a sense of purpose in patients, encouraging them to find value in their experiences despite illness or life-limiting conditions (22). This approach ultimately enhances patients’ psychological well-being and improves their overall quality of life.

Given the adverse consequences of death anxiety and hopelessness among cancer patients, the importance of this issue becomes even more significant. Preliminary reviews indicate that medical interventions alone cannot address the challenges faced by terminally ill patients, such as cancer patients (17). In this context, Watson's Theory of Human Caring may provide a way to find appropriate treatments for these patients. In particular, death anxiety and hope for life influence the quality of life and mental health in these patients. Focusing on improving these two variables can positively impact their recovery process. Despite the appeal and rapid growth of the application of Watson's Theory of Human Caring and its spread into various health fields worldwide, limited research has been conducted in this area in Iran.

Several studies from different countries have examined the impact of Watson's Theory of Human Caring on cancer patients, demonstrating its effectiveness in improving their psychological well-being and overall quality of life. A study conducted in Turkey found that implementing Watson's caring model significantly reduced symptom distress and enhanced sense of meaning in life among patients undergoing chemotherapy. By fostering a compassionate and supportive environment, nurses were able to help patients cope better with the emotional and physical challenges of cancer treatment (23). A qualitative study in Indonesia investigated the experiences of cancer patients receiving care based on Watson's theory. The findings highlighted the importance of developing a trusting relationship between nurses and patients, as well as providing faith-hope support. Patients reported feeling more emotionally secure and supported, which contributed to their psychological resilience during treatment (24). Another study in Poland focused on the difficulties faced by caregivers of palliative cancer patients. Using Watson's framework, the study emphasized the crucial role of holistic compassionate care in reducing caregiver burden and enhancing the quality of life for both patients and their families. The researchers underscored the importance of emotional and spiritual support in palliative settings, reinforcing Watson's belief that human caring extends beyond physical treatment (24, 25). These studies demonstrate that Watson's Theory of Human Caring can play a significant role in improving the experience of cancer patients across different cultural and healthcare contexts. However, there is a noticeable gap for a comprehensive and coherent study in this field. Therefore, the researchers decided to conduct this study with aim to determine the impact of a nursing care program based on Watson's Theory of Human Caring on death anxiety and hope for life among cancer patients.

Methods

This single-blind randomized clinical trial study was conducted on cancer patients referred to Iran Mehr Hospital, Birjand, in 2024. The inclusion criteria were confirmed diagnosis of cancer and having a medical record at the hospital, at least three months since the cancer diagnosis, age over 18 years, ability to read and write, willingness to participate in the study, no communication problems, no psychological issues, and undergoing treatment with chemotherapy. The exclusion criteria were non-participation in the sessions, patient death, incomplete questionnaire responses, the occurrence of stressful events (e.g., the death of a family member, divorce, and financial problems), deterioration of the patient's condition for any reason, cancer metastasis, participation in other similar programs during the intervention, continuation of treatment in other cities, and treatment with other methods, including radiotherapy and surgery. The sample size was determined as 28 participants in each group based on the average comparison formula, utilizing findings from previous study (26), and considering a 95% confidence level and a power of 80% . However, to ensure greater accuracy and to account for a 15% dropout rate, the sample size was increased to 32 individuals in each group (for a total of 64 participants), who were selected using the convenience sampling method. During the sampling phase, until the desired sample size was achieved, patients were randomly assigned to either the intervention or control group using a simple random sampling method after matching them regarding the cofounding variables including the gender, severity of the disease and other underlying variables. The patients were unaware of their group of study. Also, in this study, the method of sequentially numbered, opaque sealed envelopes (SNOSE) was used for concealment.

The researcher collected data by visiting the departments of the research environment and using the questionnaires in both groups. The tools used in this study included a demographic and disease information form, the Templer Death Anxiety Scale (DAS), and the Snyder's Adult Hope Scale (AHS). The demographic and disease information form included gender, age, marital status, residence place, education, job, economic status, type of cancer and disease severity. The 15-item DAS evaluates death anxiety and has a high reliability coefficient (Cronbach's alpha=0.88) (27). The score on this questionnaire ranges from 0 (no death anxiety) to 15 (very high death anxiety), with a median cut-off point of 6-7. Scores above 7 suggest high death anxiety, while lower scores represent low death anxiety (28). Rajabi and Bohrani tested the scale in Iran and reported an internal consistency of 73% (29).

The 12-item AHS assesses hope for life based on a 5-point Likert scale, with a minimum possible score of 12 and a maximum of 60, which scores of 12 to 24 indicate low hope for life, 24 to 36 moderate hope, and above 36 high hope. This questionnaire has a reliability coefficient of 0.81 (30). DAS and AHS have also been translated and psychometrically validated in Iran (29, 30).

After obtaining informed consent, participants in both groups completed the initial assessments. The intervention group took part in an eight-week program based on Watson's Theory of Human Caring, which focused on disease education, spiritual care, anxiety management, and enhancing hope for life, while the control group only received the standard care. Watson's Theory of Human Caring emphasizes holistic, compassionate, and patient-centered care through various activities that foster deep human connections. Nurses establish a trusting relationship with patients by actively listening, showing empathy, and providing emotional support. They create a healing environment by ensuring comfort, reducing stressors, and using soothing communication. Watson model promotes hope and faith, encouraging positive thinking and spiritual well-being. Patients are empowered through education and autonomy, helping them participate in treatment decisions. Holistic care addresses physical, emotional, social, and spiritual needs, often integrating complementary therapies like meditation and mindfulness. Nurses practice self-care and mindfulness to maintain emotional balance while advocating for humanitarian service and patient rights. Watson model by implementing these principles enhances patient well-being, satisfaction, and overall healthcare quality (21).

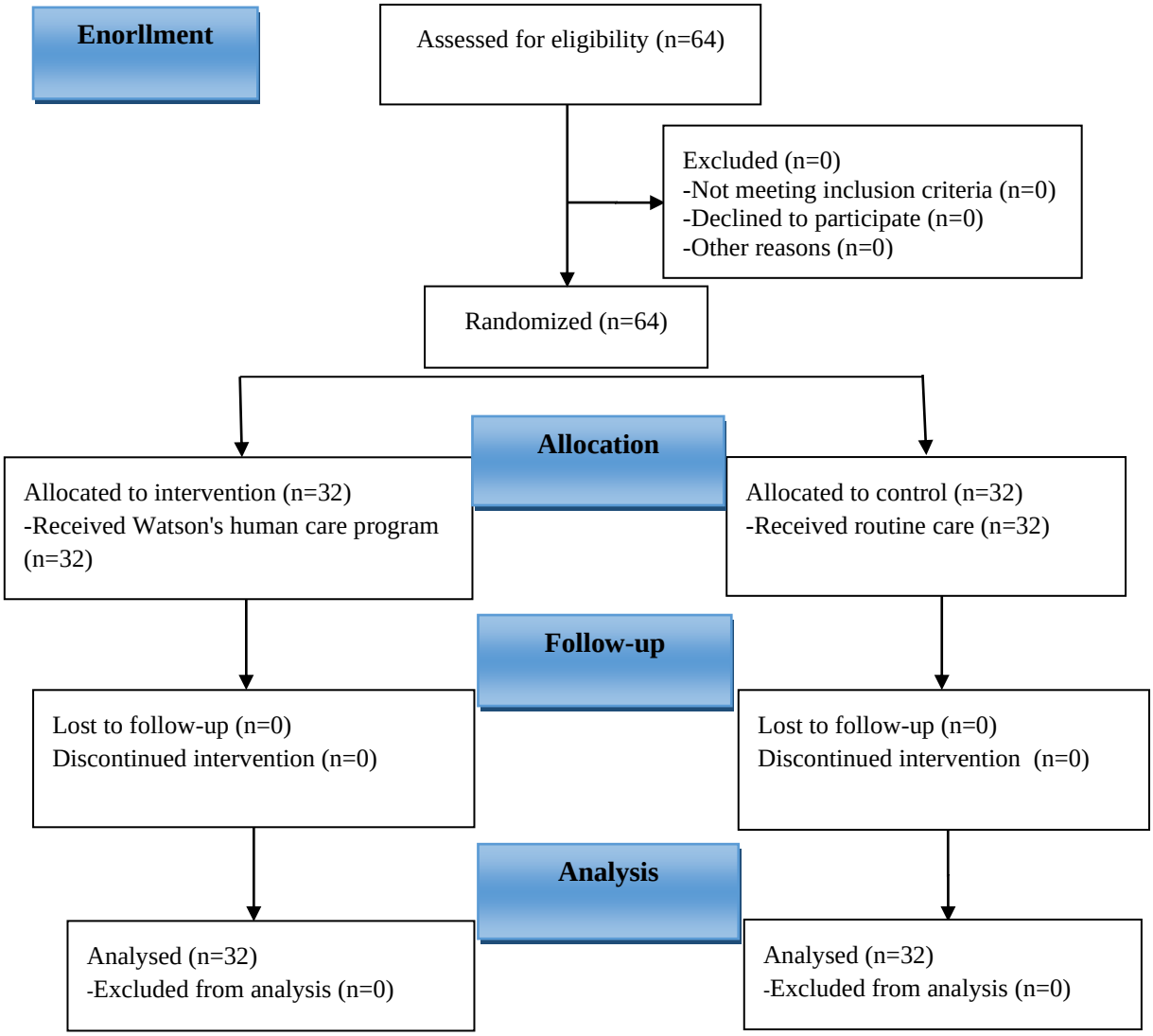

Figure 1. Flowchart of the effect of Watson's Theory of Human Caring on death anxiety and hope for life in cancer patients

The stages of the intervention were as follows:
Stage One: Participants received training on the causes of cancer, treatment side effects, nutrition, and appropriate activities for patients. Educational sessions lasted 30 to 45 minutes, and at least one family member was required to be present for support. Training included presentations and lectures, followed by assessments through questions and answers.
Stage Two: This stage focused on the role of spirituality and religion in coping with illness and included discussions on spiritual topics and effective communication with patients in group sessions.
Stage Three: Aimed at reducing death anxiety and stress, this stage included guidance from a psychologist on techniques such as abdominal breathing for anxiety management.
Stage Four: This stage aims to enhance hope by focusing on the positive aspects of life and setting promising therapeutic goals facilitated by a psychologist.
The intervention group received educational materials in the form of booklets and CDs throughout the eight weeks. The researcher maintained continuous communication with the participants to address any questions or issues. After eight weeks the DAS and AHS were completed again by patients in both the intervention and control groups. The control group received standard department care and was involved in the intervention of this study including access to the caregiver team and follow-up sessions as a routine program of the department. For follow-up purposes during 8 weeks, the researcher provided their phone number to the intervention group (the patient or a close companion of the patient) and contacted the patient every Friday, ensuring that if they had any issues or questions, they could communicate directly with the researcher. The patients participated in the sessions individually. The implementation of these four stages was adapted to the patient's condition, the duration of their stay at the hospital, and participation in the programs according to their tolerance (31); however, the interventions continued until the completion of the sampling. Consort flow chart diagram of the study is given in Figure 1.
The data were analyzed using SPSS software (version 23.0). The Kolmogorov-Smirnov and Shapiro-Wilk tests were used to assess the normal distribution of quantitative data. Descriptive statistics were utilized to describe the participants' characteristics, and parametric tests (independent and paired t-tests, ANOVA and the Tukey post hoc test and Pearson correlation test) were employed with a confidence level of 95%. $p<0.05$ was considered statistically significant.

Ethical Consideration
In all stages of the research, the ethical considerations were adhered. This study was conducted after obtaining permission from the Ethics Committee of Zabol University of Medical Sciences (ethical code: IR.ZBMU.REC.1402.085) and registering the study in the Iranian Registry of Clinical Trials (IRCT20231022059805N1). The researchers provided necessary explanations regarding the research objectives directly to each patient and obtained written informed consent.

Results
A total of 64 cancer patients participated in this study (32 in the control group and 32 in the intervention group). The mean age of patients in the intervention group was 45.56 ± 10.08 years, while in the control group was 44.31 ± 13.19 years. Among the participating patients, 16 (50%) in the intervention group and 19 (59.4%) in the control group were female, while 16 (50%) in the intervention group and 13 (40.6%) in the control group were male. The demographic characteristics of the patients is described in Table 1.
As the findings showed, 68.8% in the intervention group, and 59.4% in the control group reported a moderate economic status. Most patients in the intervention (84.4%) and control groups (59.4%) had advanced but treatable disease severity. The most prevalent type of cancer in both groups was colorectal cancer, with 10 patients (31.3%) in the intervention group and 9 (28.1%) in the control group. No patients in the intervention and control groups had a history of anxiety medication use, mental illness, or participation in educational classes. In terms of analgesic and narcotic use, 25 patients (78.1%) in the intervention and 29 in the control groups (90.6%) reported no prior use of these medications. Based on Chi-square and Fisher's exact tests, gender, residence, marital status, education level, occupation, religion, type of cancer, and use of analgesics and narcotics were comparable in the studied patients ($p>0.05$). Additionally, according to independent t-test, there was no significant difference between the two groups in terms of age ($p>0.05$).

The independent t-test revealed a significant statistical difference in the intervention group regarding hope for life following patient care with Watson's model and gender (P<0.05), with female patients having a higher mean hope for life after care than male patients. However, the mean death anxiety before care and the hope for life before and after patient care did not demonstrate a significant difference between the two groups based on gender (p>0.05).

Table 1. The demographic information of the patients in the intervention and control groups

Variables	Groups	
	Intervention N=32	Control N=32
Residence		
Urban	13 (40.6%)	12 (37.5%)
Rural	19 (59.4%)	20 (62.5%)
Marital status		
Married	31 (96.9%)	28 (87.5%)
Single	1 (3.1%)	4 (12.5%)
Education level		
Elementary	16 (50%)	18 (56.2%)
Higher education	16 (50%)	14 (43.7%)
Occupation		
Self-employed	16 (50%)	0 (0%)
Housewife	0 (0%)	16 (50%)
Economic status		
Moderate	22 (68.8%)	19 (59.4%)
Low	10 (31)	13(41)
Disease severity		
Advanced but treatable	27 (84.4%)	19 (59%)
Treatable	5 (15.6%)	13 (41%)
Cancer type		
Colorectal cancer	10 (31.3%)	9 (28.1%)
Others	22 (68%)	23(71%)

Based on the independent t-test, a statistically significant difference was observed in the intervention group between death anxiety after care and marital status (p<0.05), where the mean death anxiety after care in married individuals was less than that in single individuals. However, the mean death anxiety before care and the hope for life before and after care did not show a significant difference between the two groups based on marital status (p>0.05).

According to the one-way ANOVA test , a statistically significant difference was observed in the intervention group regarding death anxiety and hope for life after patient care with respect to education level (p<0.05). The Tukey post hoc test indicated that the mean death anxiety after care in individuals with elementary education was lower than that in others, while the hope for life after care was higher in individuals with bachelor's degrees compared to others. However, the mean death anxiety and hope for life before and after care in the control group did not show a significant difference in terms of education level (p>0.05).

The results of the one-way ANOVA in the intervention group showed a statistically significant difference in hope for life after patient care with respect to the cancer severity (p<0.05). The Tukey post hoc test indicated that the mean hope for life after patient care was higher in individuals with advanced but treatable cancer compared to others. However, no significant difference was reported in mean death anxiety and hope for life before and after patient care in the control group concerning cancer severity (p>0.05). However, after the intervention, the mean death anxiety in the control group was reported to be higher (p<0.05).

As the results of the paired t-test in the intervention group, a statistically significant difference was observed in death anxiety before and after the intervention (p<0.05), indicating that the mean death anxiety decreased after the intervention. Similarly, in the control group, a significant difference was observed in death anxiety before and after the intervention (p<0.05), so that the mean death anxiety was lower before the intervention (Table 2).

According to Table 2 and based on the independent t-test, no statistical difference was observed between the control and intervention groups in terms of hope for life before the intervention (p>0.05). However, after the intervention, the mean hope for life was reported to be higher in the intervention group (p<0.05).

Table 2. Comparison of mean death anxiety scores before and after the intervention in intervention and control groups

Death anxiety		Score of death anxiety (Mean±SD)		Analysis of changes	Paired t-test	
		Before intervention	After intervention		Statistic	p-value*
Control group		7.46±0.76	8.03±1.35	-0.56±1.18	12.703	<0.001
Intervention group		7.46±0.91	5.15±1.19	2.31±1.02	-2.675	0.012
Independent t-test	Statistic	0.000	-9.002	7.296		
	p-value**	1.000	<0.001	<0.001		

*p-value within the group for comparison of the effect of the intervention.
**p-value between the groups to present matching of them prior to the intervention.

The findings of the Table 2 showed lack of statistically significant different between the two groups, prior to the intervention and between the groups (control vs. intervention).

Based on the paired t-test in the intervention group, a statistically significant difference was observed in hope for life before and after the intervention (p<0.05), indicating that the mean hope for life had increased after the intervention. Additionally, in the control group, a statistically significant difference was observed in death anxiety before and after the intervention (p<0.05), with higher hope for life before the intervention (Table 3).

Table 3. Comparison of hope for life in the intervention and control groups

Hope for life		Score of hope for life Mean±SD		Analysis of changes	Paired t-test	
		Before intervention	After intervention		Statistic	p-value*
Control group		21.59±2.74	25.18±2.77	2.88±-3.59	6.499	<0.001
Intervention group		20.15± 4.64	23.81±3.61	4.05±3.66	5.089	<0.001
Independent t-test	Statistic	-0.466	-2.556	0.064		
	p-value**	0.517	0.014	0.861		

*p-value within the group for comparison of the effect of the intervention.
**p-value between the groups to present the matching of them prior to the intervention.

The findings of the Table 3 showed lack of statistically significant different between the two groups, prior to the intervention and between the groups (control vs. intervention).

According to the Pearson correlation test in the intervention group, there was a statistically significant inverse relationship between death anxiety before patient care and death anxiety after patient care (r=-0.551, p<0.05), indicating that death anxiety decreased as care increased. . Additionally, there was a statistically significant direct relationship between hope for life before care and hope for life after care (r=0.541, p<0.05), suggesting that as care increased, hope for life also increased (Table 4).
As the results of Pearson correlation test revealed, no statistically significant correlation was found between death anxiety and hope for life in cancer patients in the control group before and after patient care (p>0.05).
The results of the ANCOVA indicated that, after adjusting for baseline differences, there was no statistically significant difference between the two groups in post-test scores (p>0.05). Therefore,

the nursing intervention did not have a statistically significant effect on increasing hopefulness. Although a slight improvement was observed in both groups' post-test means, the difference was not statistically significant and may be attributed to external factors or natural fluctuations over time.

Table 4. Pearson's correlation test result between death anxiety and hope for life in cancer patients in the intervention group before and after patient care

Intervention		Death anxiety before care	Death anxiety after care	Hope for life before care	Hope for life after care
Death anxiety	Pearson correlation coefficient	1	-0.551	-0.012	0.119
	P-value*		0.000	0.95	0.517
Death anxiety after care	Pearson correlation coefficient		1	0.112	0.339
	P-value			0.543	0.548
Hope for life before care	Pearson correlation coefficient			1	0.541
	P-value				0.000

The death anxiety score in cancer patients was assessed before and after the intervention. The mean death anxiety score in the intervention group decreased from (7.46±0.91) to (5.15±1.19), whereas in the control group, it increased from (7.46±0.76) to (8.03±1.35). Analysis of covariance (ANCOVA) with baseline values controlled showed that the difference between the two groups was statistically significant after the intervention (p<0.0001), indicating a significant effect of the Watson nursing intervention in reducing death anxiety in cancer patients.

Discussion

The purpose of the present study was to assess the impact of Watson's Theory of Human Caring on death anxiety and hope for life in cancer patients. The diagnosis of cancer has a profound effect on patient well-being and often leads to a decrease in the quality of life, increased anxiety, and a higher prevalence of depression and hopelessness (7, 8). Death anxiety is a significant psychological challenge among cancer patients (10), and a cancer diagnosis can be a severe threat to patients' hope (32). Watson's humanistic model of nursing promotes a caring relationship between nurse and patient, creating an environment conducive to healing and emotional support (20).

The results of the current study indicated that the implementation of Watson's Theory of Human Caring program reduced death anxiety in cancer patients. This finding aligns with the study of Seven et al. (2023) conducted on hospitalized patients in palliative care ward in Turkey showed that the implementation of Watson's Theory of Human Caring model reduced anxiety. They also demonstrated that the implementation of this model could reduce shortness of breath and improve the quality of life (33). Furthermore, a study by Tekas et al. (2017) conducted on women after miscarriage showed that nursing interventions based on Watson's Theory of Human Caring significantly reduced anxiety levels in these patients (34), which were consistent with our findings, while their study didn't assess the pre-intervention statues of the participants. Durgun et al. (2017) also demonstrated that Watson's Theory of Human Care serves as a guideline for nursing patients with infertility to effectively reduce anxiety levels (31). To interpret this finding, we can say that the implementation of nursing care based on Watson's Theory of Human Caring can effectively reduce death anxiety in these patients. This effect may be attributed to the model's focus on emotional presence and empathy. By establishing an emotional relationship, nurses can enhance patients' feelings of safety and calmness. They just considered one item, while by using Watson's Theory of Human Caring that addresses all physical, emotional, and spiritual aspects of care, we conducted a wider spectrum of well-being. Addressing all aspects of the spiritual and emotional needs of patients may help alleviate death anxiety. Furthermore, the Watson model enhances patients' sense of control over their circumstances, which also contributes to decreased feelings of death anxiety.

The present study demonstrated that the implementation of nursing care based on Watson's Theory of

Human Caring not just reduced the death anxiety, but also improved the hope for life among patients with malignancy. According to our search scope, this study was the first to examine the impact of implementing nursing care based on Watson's Theory of Human Caring on hope for life. Therefore, we will refer to studies with similar variables to compare our findings with other studies.

Turkcu et al. (2021) in their study on female gynecological cancer patients indicated that the implementation of nursing interventions based on Watson's Theory of Human Caring enhanced the quality of life (35). Previous studies have shown a close conceptual relationship between hope for life and the quality of life, as a higher quality of life often associated with healthier lifestyle choices that can extend lifespan (36). Hope for life is related to the quality of life, satisfaction, and well-being (37, 38). Therefore, the results of these studies were consistent with the findings of the current study. Additionally, previous studies have demonstrated that the implementation of nursing care based on Watson's Theory of Human Caring increases patient satisfaction rates (39). Higher patient satisfaction can positively affect hope for life, leading to better adherence to treatment plans and healthier lifestyle choices (40, 41). When patients feel valued and supported, their mental health improves, stress decreases, and overall health is enhanced (42). Moreover, highly satisfied patients are more likely to participate in regular care and facilitate health management. These factors can contribute to better health outcomes and potentially increase hope for life (43, 44). The intervention group, which received holistic nursing care, including disease education, spiritual support, and anxiety management, exhibited lower levels of death anxiety and improved hope for life compared to the control group. The findings of these studies emphasize the importance of integrating holistic nursing approaches, such as those based on Watson's Theory of Human Caring, in the clinical practice of cancer patients. These interventions not only enhance emotional and psychological well-being through improved quality of life and patient satisfaction, but also promote physical health, leading to improved longevity. Watson's Theory of Human Caring has a significant impact on cancer patients' hope for life by emphasizing emotional connections, reducing anxiety, and addressing spiritual and emotional needs.

This study had some limitations, such as it was conducted on a limited number of the patients and short duration of follow-up; it is suggested that further research trials be conducted in larger study groups and for elongated intervals to evaluate the long-term effect of the method on the well-being and outcome of the patients as the malignant diseases are commonly have chronic presentations.

Implications for practice

The results of this study showed that the implementation of Watson's Theory of Human Caring program significantly could reduce death anxiety and increase hope for life among cancer patients. These findings emphasized the importance of human interventions in nursing based on Watson's Theory to address not only the physical needs but also the psychological and emotional needs of cancer patients. By creating a supportive environment through compassionate care, healthcare providers can have a positive impact on patient's well-being and potentially improve their overall quality of life. These positive effects help patients cope more successfully with the challenges of their illness and experience a meaningful form of care. Future research should investigate the long-term effects of such interventions and integrate these comprehensive approaches into standard cancer care practices.

Acknowledgments

This article was the result of a master's degree thesis in Medical Surgical Nursing at Zabol University of Medical Sciences. We would like to express our gratitude to the cancer patients and their families, the respected officials of Iran Mehr Hospital, the nurses, and the honorable professors who assisted the researcher in conducting this study.

Conflicts of interest

The authors declared no conflict of interest.

Funding

None.

Authors' Contributions

Razieh Nikbakht, Mahdieh Poodineh Moghadam and Somayeh Bagheri contributed to the conception, design, data collection, data analysis and drafting the manuscript. Mahdieh Poodineh Moghadam, Hossein Shahdadi and Mozhgan Rahnama performed conception, design, supervision of project, and revising the manuscript. Mahdieh Poodineh Moghadam and Mozhgan Rahnama conducted data collection and revising the manuscript. All authors contributed to the writing of the manuscript and discussed on the manuscript.

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