RESEARCH ARTICLE

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The Relationship between Religious Well-Being, Existential Well-Being, Fear of Progression and Quality of Life in Patients with Cancer: The Mediating Role of Hope

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Abstract

Background: A cancer diagnosis can be psychologically challenging to individuals due to perceptions that the disease is potentially incurable truncating life expectancy. The purpose of the study was to examine the relationships among religious well-being, existential well-being, fear of progression and quality of life in Iranian patients with cancer and to evaluate the potential mediating role of hope on these relationships. **Methods:** This study with predictive cross-sectional design was done in 2023. Data was gathered from 398 patients with cancer that was selected with accessible sampling method from cancer center of Mazandaran university of medical sciences (Sari, Iran). Study constructs included the religious and existential wellbeing, cancer fear of progression, Snyder Hope, and quality of life. Analysis of a Moment Structures (AMOS) software (v27) was utilized for all study analyses. Covariance based-structural equation modeling (SEM) was used to assess the mediating role of hope. **Results:** The mean age of patients with cancer was 49.14 (SD = 16.16). The results of the direct effect showed a significant positive relationship between religious well-being and hope ($B = 0.164$, $p < .001$), and between hope and quality of life ($B = 0.212$, $p < 0.001$). Also, significant negative relationship between fear of progression and hope ($B = -0.147$, $p < 0.05$) was founded. **Conclusion:** A significant positive relationship between hope and quality of life, as well as religious well-being and hope, suggests the influential effects of hope and religious well-being on improving quality of life in patients with cancer. Negative relationships between fear of progression and hope conclude that managing fear of progression may be an important factor in increasing hope and improving quality of life in patients with cancer.

Keywords: Life expectancy- fear- quality of life- Neoplasms

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Introduction

Cancers are a major public health and economic concern as a leading cause of death globally and a major source of human morbidity and mortality. In 2020, cancers globally attributed to more than 10 million deaths [1], In Iran, there were 131,191 new cancer cases and 79,136 deaths caused by cancer in 2020. Among those Iranian cases, breast cancer was the most commonly diagnosed (12.9%) followed by stomach (11.2%), colorectal (9.1%), lung (8%) and prostate (6.8%) [2]. Based on epidemiological trends, a recent study indicated that there will be a 40% increase in new cancer cases in Iran by 2025 [3]. A cancer diagnosis can be psychologically challenging to individuals due to perceptions that the disease is potentially incurable truncating life expectancy. Patients with cancer can thus experience a high burden of both psychological and physical distress that adversely affects their perceived quality of life, a key indicator of perceived health [4]. Recent studies have shown that a majority of patients with cancer in Iran do not seek medical care until later stages of the disease [5, 6]. Such delays in diagnosis and treatment not only increase mortality but also contribute to decrements in quality of life.

Individuals diagnosed with cancer often encounter physical disabilities, functional limitations, mental

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health concerns (e.g., depression, anxiety), and other symptoms such as appetite loss, pain, fatigue, and dyspnea secondary to the disease and associated treatments [7, 4] that adversely affect daily function and quality of life [7, 4]. Past studies have identified several factors affecting quality of life in Iranian individuals with cancer. Those factors include socio-demographic characteristics, such as gender [8], age [8, 9], health promoting lifestyle [10], and financial burden [11]. Additional influencing factors include psychological and clinical characteristics such as presence of pain [7, 12], social support [13, 14], depression and anxiety [15, 16], and perceived self-efficacy [17].

Many individuals diagnosed with cancer turn to their religious faith for palliation, particularly in the country of Iran [18]. Quality of life is closely linked to religious well-being, the satisfaction received from their connection with a divine power, and existential well-being, a sense of understanding the purpose and meaning of life [19]. There are mixed findings relative to the relationships between religious well-being, existential well-being, and quality of life. Hope plays a crucial role in safeguarding the mental well-being of individuals, serving as a protective mechanism against stress and illness. Moreover, it acts as a prerequisite for enabling effective coping strategies [20]. Hope, frequently described as a feeling of assurance and trust in favorable outcomes, is closely linked to a positive mindset and can be derived from spirituality and religious convictions [21]. On the one hand, religious and existential well-being offer hope to individuals suffering from cancer and thus positively affect their quality of life [22]. Religious beliefs that contribute to wellbeing may foster effective coping strategies for individuals with cancer [23, 22]. A meaningful connection with a personal higher power may support individuals to maintain a positive appraisal of their life, reduce cognitive dissonance, enhance mental and physical wellbeing, and their capacity to cope with illness symptoms [24]. Spirituality positively affects the quality of life and feeling of satisfaction by offering hope and by contributing to lowered anxiety and depressive symptoms [25]. Such beneficial effects may foster acceptance and help individuals to cope with their illness in a positive and purposeful way [22]. However, other studies have found religious well-being to be a negative predictor of quality of life [26, 27]. Individuals diagnosed with cancer struggle with considerable psychosocial [28] and physical treatment burden [29]. Such burden not only affects the individual's psychological and physical wellbeing, but may also contribute to either or both a religious and existential crisis [30]. These hurdles can also be associated with reduced motivation to receive cancer care, thus negatively impacting the success of the proposed treatment plan [29]. In addition, research suggests that negative religious coping (i.e., negative attitudes towards God or a Supreme Being) predict worse quality of life and depression outcomes [26], especially among those diagnosed with chronic illnesses [27].

A cancer diagnosis and associated treatment not only adversely affects quality of life but also impairs social relationships, which can contribute to family communication issues and dysfunction [31]. Further, the presence of cancer increases awareness of proximity to death [32] and to a loss of hope [31]. The presence of hope assists patients to adapt with the challenges of cancer [33]. Further, hope is associated with improved psychosocial well-being and thus contributes to higher quality of life [34]. Hope may also improve the capacity for individuals with cancer to spend more time with their families and to enjoy their remaining days [35].

Fear and worries about the return or progression of cancer are commonly reported by cancer survivors [36, 37]. Fear of progression can be very disruptive to cancer survivors and their loved ones, while also closely linked to anxiety, depressive symptoms, post-traumatic stress, and poor quality of life [38]. However, previous findings around the relationship between fear of progression and quality of life are limited. Some studies have found no relationship [39, 40], while other studies have found negative links between fear of progression and quality of life [41, 38]. Research has shown that fear of progression is one of the most frequent distress symptoms of patients with cancer, with about 50% of survivors experiencing moderate to severe fear of progression [37].

Based on available databases no study was done about mediating role of hope in this relationship. So, the present study evaluates relationships between religious well-being, existential well-being, and fear of progression on quality of life. It also explores whether hope mediates the association between religious well-being, existential well-being, and fear of progression on quality of life among Iranian patients with cancer.

Materials and Methods

Research design

This study employed a predictive cross-sectional survey design to examine the relationships between religious well-being, existential well-being and fear of progression on quality of life, as well as the mediating role of hope in these relationship among Iranian patients with cancer.

Participants

Surveys were administered either online or via paper/pencil using convenience sampling. Inclusion criteria were: 1) patients who were undergoing chemotherapy, radiotherapy, and surgical treatment for cancer (assessed with patient's medical records); 2) age 18 years and older, and 3) able to read and write in Persian sufficiently to meet the goals of the study. Exclusion criteria were: 1) documented history of psychiatric illness (assessed with patient's medical records); and 2) chronic medical conditions that would impede the ability to participate in the study. Informed signed consent was obtained from all participants. A sample size 376 was determined based on the sample size formula for structural equation modeling [42] and considering the anticipated effect size 0.2, desired statistical power level 0.8, number of latent variables 5, number of observed variables 40 and probability level 0.05. In total, considering the possibility of participants with missing data, 398 patients with cancer completed the scales between February and May 2023 from two major comprehensive cancer hospitals in Tehran, Iran.

Measurement tools

Demographic variables such as age and sex were gathered with checklist.

Religious well-being and Existential well-being

To measure religious well-being and existential well-being, this study adopted the Iranian version of the spiritual well-being scale (SWBS) [43]. The scale included a 10-item religious well-being subscale (i.e., evaluating one's relationship with God) and a 7-item subscale of existential well-being (i.e., evaluating one's sense of life purpose and life satisfaction). Response options were rated on a 6-point Likert- scale from 1 (strongly disagree) to 6 (strongly agree). The Persian version of the SWBS is a reliable and valid measure to assess the spiritual well-being of patients with cancer [44]. The psychometric of SWBS evaluated in Iranian population [45-47].

Fear of progression

To assess fear of progression on cancer, this study adopted the 12-item Fear of Progression Questionnaire (FOP-Q-12) [48]. Participants rated each item (e.g., "Being nervous prior to doctor's appointment or periodic examinations") using a 5-point Likert-scale from 1 (never) to 5 (very often). The Persian version of the FOP-Q-12 had acceptable reliability and validity for patients with cancer in Iran [49].

Hope

Hope was measured using 11 items from the Iranian version of the Hope Scale [50] and 2 subscales from Sharif-Nia et al. [51]. The scale assessed two subscales of hope: 1) optimism in life (e.g., "Even when others get discouraged, I know I can find a way to solve the problem"); and 2) despair (e.g., "Usually find myself worrying about something"). Participants were asked to rate each item to the extent to which it applied to them using a 4-point Likert- scale from 1 (definitely false) to 4 (definitely true). Sharif-Nia et al. revealed that the Hope Scale has acceptable validity and reliability, which can be used to measure the hope concept among Iranian patients with cancer [52].

Quality of life

The EORTC QLQ-c30 [53] was used to measure quality of life (QOL). The EORTC QLQ-c30 consists of 30 questions capturing five functional scales (physical, role, emotional, cognitive, social), three symptom scales, overall perceived health, QOL, and perceived financial impact of the cancer and its treatment. The total score of the QoL was calculated to represent the overall level of QOL. Scoring ranges from 30–126, with higher scores reflecting higher quality of life.

Data analysis

Covariance based-structural equation modeling (SEM) was used to assess the measurement and mediation models. Following the two-step approach, the measurement model was first assessed by performing the confirmatory factor analysis (CFA). In this step, the model fit, internal consistency, construct reliability, and construct validity were assessed. To assess the model fit, several fit indices were (e.g., Chi-square (χ^2) test, Chi-square (χ^2) / degree of freedom ratio (DF) < 5, standardized root mean square residual (SRMR) < 0.09, and root mean square error of approximation (RMSEA) < 0.08) [54].

Internal consistency and construct reliability were assessed using Cronbach's alpha (> 0.7), composite reliability (> 0.7), and maximal reliability (> 0.7) [51]. Construct validity was assessed through convergent validity (e.g., composite reliability >0.70, Average variance extracted >0.5) and discriminant validity. Discriminant validity was assessed using the Heterotrait-monotrait ratio of correlations (HTMT) creteria (i.e., all values <0.85) [55]. In the second step, the mediation model was developed, and all indirect relationships were assessed using the bias-corrected bootstrapping technique with 2000 replications [14]. Also, According to Fornelland Larcker [56], for convergent and discriminant validity, if the average variance extracted of the construct is less than .5, composite reliability greater than 0.7 can confirm convergent validity of the construct. AMOS software (v27) was utilized for all study analyses. All tests in this study were two-tailed and a p-value of less than .05 was considered statistically significant.

Results

The mean age of the participants was 49.14 (SD = 16.16, 95%CI: 47.55 to 50.74). Most of the patients were male (56.8%, N = 226). Also, a majority of participants (60.6%, N = 241) had stage 3 cancer.

Using the two-stage approach, the measurement model was first assessed through maximum likelihood CFA. The model fit indices of measurement model with all first-order constructs indicated that the data fit the model well [$\chi^2(723) = 2353.261$, $p < .001$, $\chi^2/df = 3.255$, SRMR = 0.064, and RMSEA (90% CI) = 0.075 (0.072, 0.079)]. Next, Hope was included in the measurement model as second-order construct, the results showed that the final measurement model fit also fit the data well [$\chi^2(726) = 2457.951$, $p < 0.001$, $\chi^2/df = 3.386$, SRMR = 0.064, and RMSEA (90% CI) = 0.078 (0.074, 0.81)], and all factor loadings were significant and greater than .5. Table 1 shows the results of the measurement model assessment. All constructs, including first- and second-order constructs, demonstrated acceptable internal consistency (0.707 to 0.956), construct reliability (0.707 to 0.956), and maximum reliability (0.718 to 0.960).

The average variance extracted for religious well-being and fear of progression were greater than 0.5, but were slightly less than 0.5 for existential well-being and hope. Therefore, based on the composite reliability greater than 0.7 for all constructs, convergent validity was achieved. Table 2 shows the results of the discriminant validity, all values of the HTMT matrix were less than 0.85, establishing discriminant validity of all constructs.

Study findings of the direct effects of the mediation model are summarized in Table 3. The proposed mediation model and hypotheses were tested while controlling for the effect of patients' gender, age, education level, economic status, and years with cancer. The results of the direct

Table 1. Measurement Model Assessment

Item	Construct First order construct	Factor loading	α	CR	MaxR	AVE
Religious well-being						
1: I don't find much satisfaction in private prayer with God		0.78	0.928	0.929	0.939	0.568
2: I don't know who I am, where I came from, or where I'm going		0.676				
3: I believe that God loves me and cares about me		0.705				
4: I feel that life is a positive experience		0.828				
5: I believe that God is impersonal and not interested in my daily situations		0.869				
6: I feel unsettled about my future		0.658				
7: I have a personally meaningful relationship with God		0.839				
8: I feel very fulfilled and satisfied with life		0.781				
9: I don't get much personal strength and support from my God		0.772				
10: I feel a sense of well-being about the direction my life is headed in		0.582				
Existence well-being						
1: I believe that God is concerned about my problems.		0.527	0.848	0.853	0.862	0.457
2: I don't enjoy much about life		0.751				
3: I don't have a personally satisfying relationship with God		0.61				
4: I feel good about my future		0.741				
5: My relationship with God helps me not to feel lonely		0.696				
6: I feel that life is full of conflict and unhappiness		0.722				
7: I feel most fulfilled when I'm in close communion with God		0.657				
Fear of progression						
1: I become anxious if I think my disease may progress		0.802	0.956	0.956	0.96	0.647
2: I am nervous prior to doctors' appointments or periodic examinations		0.797				
3: I am afraid of pain		0.85				
4: I have concerns about reaching my professional goals because of my illness		0.824				
5: When I am anxious, I have physical symptoms such as a rapid heartbeat, stomach ache or agitation		0.787				
6: The possibility of my children contracting my disease disturbs me		0.717				
7: It disturbs me that I may have to rely on strangers for activities of daily living		0.75				
8: I am worried that at some point in time I will no longer be able to pursue my hobbies because of my illness		0.819				
9: I am afraid of severe medical treatments during the course of my illness		0.891				
10: I worry that my treatment could damage my body		0.868				
11: I worry about what will become of my family if something should happen to me		0.726				
12: The thought that I might not be able to work due to my illness disturbs me		0.799				
Hope_Optimsim life						
1: I can think of many ways to get out of a jam		0.655	0.897	0.899	0.901	0.526
2: I energetically pursue my goals		0.731				
3: There are lots of ways around any problem		0.709				
4: I can think of many ways to get the things in life that are most important to me		0.747				
5: Even when others get discouraged, I know I can find a way to solve the problem		0.786				
6: My past experiences have prepared me well for my future		0.72				
7: I've been pretty successful in life		0.704				
8: I meet the goals that I set for myself		0.697				
Hope_Despair						
1: I feel tired most of the time		0.634	0.701	0.707	0.718	0.447
2: I am easily downed in an argument		0.58				
3: I worry about my health		0.808				
Second order construct						
Hope			0.86	0.86	0.869	0.467
Optimism life		0.726				
Despair		0.637				

α, Cronbach's alpha; CR, Composite reliability; MaxR, Maximal Reliability; AVE, Average variance extracted

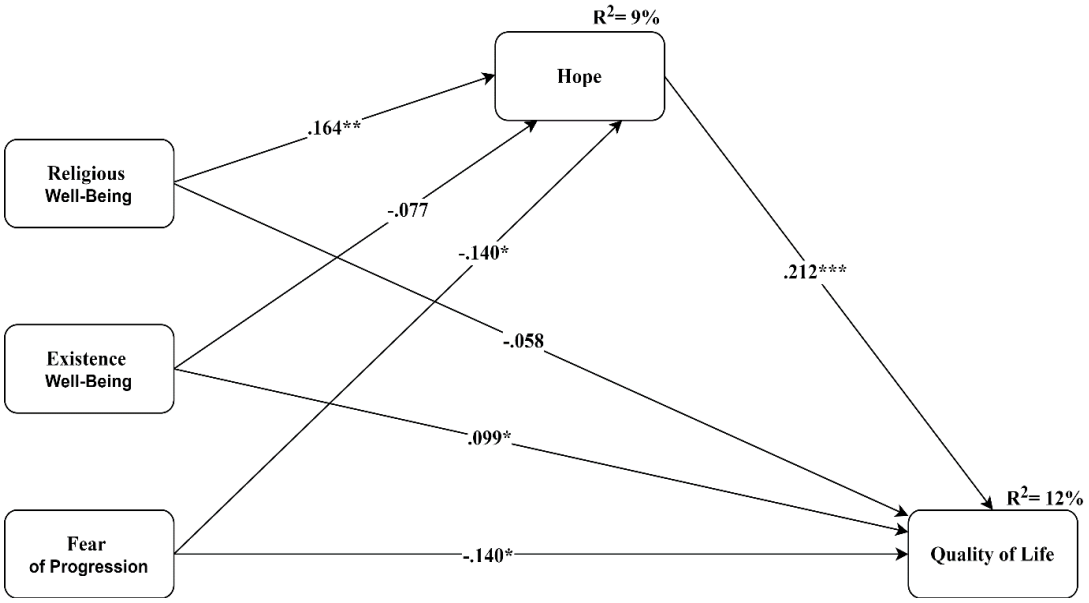

Figure 1. The Results of the Mediation Model Assessment; *** p < 0.001, ** p < 0.01 * p < 0.05

effect showed a significant positive relationship between religious well-being and hope (B = 0.164, p < 0.01), and between hope and quality of life (B = 0.212, p < 0.001), providing the support of H1 and H4. Further, the significant negative relationship between fear of progression and hope (B = -0.147, p < 0.05) supported H3. This study, however failed to support H2 relative to a significant positive relationship between existential well-being and hope (B = -0.077, p = 0.156).

Table 3 summarizes the indirect effects of the mediation model. Study findings supported the indirect effects of hope in the relationship between religious

Table 2. Discriminant validity Assessment Using HTMT Matrix

	Construct					(5)
Heterotrait-monotrait ratio of correlations (HTMT)	First order construct					
	(1) Religious Well-being					
	(2) Existences Well-being	0.333				
	(3) Fear of progression	0.361	0.185			
	(4) Hope_Optimsim life	0.213	0.162	0.259		
	(5) Hope_Despair	0.094	0.256	0.312	0.405	
	Second order construct					
	(6) Hope	0.155	0.063	0.13	-	-

Table 3. Mediation model Assessment

Paths	Standardized Path coefficients	95% confidence level (Lower Bound, Upper Bound)
Direct Effects		
Religious well-being → Hope	0.164**	(0.047, 0.268)
Existence well-being → Hope	-0.077	(-0.172, 0.020)
Fear of progression → Hope	-0.147*	(-.254, -0.028)
Hope → Quality of life	0.212***	(0.122, 0.298)
Religious well-being → Quality of life	-0.058	(-0.147, 0.036)
Existence well-being → Quality of life	0.099*	(0.004, .197)
Fear of progression → Quality of life	-0.140*	(-0.239, -0.042)
Mediation Effects		
Religious well-being → Hope → Quality of life	0.035*	(0.010, 0.070)
Existence well-being → Hope → Quality of life	-0.016	(-0.041, 0.002)
Fear of progression → Hope → Quality of life	-0.031*	(-0.059, -0.011)

*** p < 0.001, ** p < 0.01, * p < 0.05.

well-being and quality of life (H5; B = 0.035, p < 0.05), and between fear of progression and quality of life (H7; B = -0.031, p < 0.05). However, the results did not support the indirect effect of hope in the relationship between existential well-being and quality of life (H6; B = -0.016, p = 0.133). The mediation model explained 9% of the total variance of hope, and 12% of the total variance of QoL. Figure 1 depicts the results of the mediation model.

Discussion

The study sought to examine the relationships among religious well-being, existential well-being, fear of progression and quality of life to potential mediating role of hope on these relationships. Findings provide insight into the potential impact of hope in supporting patients with cancer. Consistent with the existing knowledge [57-59], the current findings demonstrated a positive relationship between religious well-being and hope. However, existential well-being was not related to the hope construct. Existential well-being, while related to both religiosity and spirituality, can be independent of both. Thus, it is plausible that participants did not subscribe to an intrinsic and subjective faith with a belief that things would work out in a positive direction. Also, the study's sample of patients with cancer might have been diverse in terms of their demographic characteristics, cancer types, stages, and treatment experiences. This variability can affect the observed relationships in the study. Patients with cancer often adopt various psychological coping mechanisms to deal with their illness. While hope and existential well-being can be related, some individuals may rely on different coping strategies, and these strategies may not necessarily align with the conventional definitions of hope and existential well-being. Hope can positively impact religious well-being by reinforcing an individual's faith and belief system [60]. When patients with cancer maintain hope for recovery or a better quality of life, they may find strength and comfort in their religious or spiritual beliefs. This can lead to an increased sense of connection with a higher power, a stronger sense of meaningfulness in their suffering, and a deeper sense of inner peace [59]. Hope can strengthen a person's faith or religious convictions [61]. When individuals facing cancer hold on to hope, they may experience a deepening of their religious faith. This may involve a renewed commitment to religious practices, a closer relationship with religious communities, and a heightened sense of spirituality [59]. Hope can serve as a coping mechanism for patients with cancer dealing with the challenges of their illness. Religious and spiritual beliefs often play a significant role in this coping process. Hope can support individuals' capacity to manage their emotional distress and the uncertainties that a diagnosis of cancer brings, strengthening the desire to engage in religious practices and to derive associated solace [57].

Similar to other studies [62-64], findings demonstrated that hope was directly related to quality of life. Maintaining hope can lead to improved psychological well-being for patients with cancer. It bolsters maintenance of a positive outlook, reduces feelings of despair, and promotes emotional resilience. The presence of hope may counteract or lessen anxiety and depressive symptoms, contributing to a better overall mental state [59]. Coping with cancer and its treatments can be physically and emotionally taxing. Hope also empowers patients with a sense of control and the emotional resilience needed to endure the challenges associated with cancer. Patients with hope are more likely to adopt a problem-solving approach to their illness. It can serve as a powerful motivator for patients with cancer to actively participate in their treatment plans. Patients who believe in the potential for improvement and recovery are more likely to adhere to medical recommendations, such as attending appointments, taking medications as prescribed, and following lifestyle changes that can enhance their well-being [62]. When patients are hopeful, they may be more open to seeking help, sharing their feelings, and connecting with family and friends. This social support network provides emotional assistance and reduces feelings of isolation, which can significantly enhance a patient's quality of life. Patients with cancer who maintain hope may report lower levels of pain and discomfort. This is partly due to the psychological and emotional resilience that hope can provide, making them more capable of managing pain effectively. They may feel more empowered to make decisions about their treatment, set personal goals, and engage in activities that bring them joy. This sense of autonomy contributes to an improved quality of life [64].

Findings also demonstrated that hope was inversely related to fear of cancer progression. This finding is supported by previous studies [65, 66]. Hope often acts as a psychological buffer against fear and anxiety related to cancer progression. When patients have hope, they tend to experience lower levels of fear and worry about the disease spreading or worsening. The positive emotions associated with hope counterbalance the negative emotions linked to fear of progression. Patients with cancer with hope may anticipate better outcomes, including stable health or even remission. This positive outlook can mitigate the fear of progression by emphasizing the potential for improvement rather than deterioration [66]. Several interventions have been developed to help patients with cancer cope with fear of progression, including cognitive-behavioral therapy, mindfulness-based interventions, and nurse-led interventions [67]. Patients with hope are more likely to engage in adaptive coping strategies, such as seeking emotional support, adhering to treatment plans, and making lifestyle changes. These actions can reduce the fear of cancer progression by promoting a sense of control and active management of the illness [65].

The current study's findings supported the indirect effects of hope in the relationship between religious well-being and quality of life and between fear of progression and quality of life. To our knowledge, this was one of the first studied that assessed the mediating role of hope in the relationship of these variables in patients with cancer. When hope is present, it can enhance the positive effects of religious well-being on quality of life. In other words, patients with cancer who have both a strong sense of religious well-being and high levels of hope may experience an even greater improvement in their quality

of life [68]. Hope can amplify the beneficial impact of religious well-being. Also, hope can introduce conditional effects on the relationship between religious well-being and quality of life. The strength of this conditional effect depends on various factors, including the individual's level of hope, the intensity of their religious well-being, as well as their unique life circumstances [68]. Further, when hope is present at higher levels, it can enhance the quality of life, even in the face of significant fear of progression. In other words, patients with cancer who maintain strong hope may experience a higher quality of life despite their fears. Hope can act as a buffer against the negative impact of fear of progression. Patients with moderate to high levels of hope may experience a milder decline in their quality of life due to fear compared to those with low levels of hope [69].

Limitations and strength

The study is limited by the cross-sectional design. Not only does the design negate the possibility of determining causal relationships but also prevents the opportunity for examining changes over time. Further, the convenience sampling of a heterogeneous group of patients with cancer reduces generalizability. Self-reported surveys also potentially be influenced by social desirability and memory recall issues. It is recommended that future studies evaluate the study constructs following diagnosis with longitudinal follow-up. Given the subjective nature of the hope experience, mixed methods design that capitalize on both quantitative and qualitative methodology are recommended.

The research addresses a crucial and relevant topic - the psychological well-being of cancer patients. Understanding the interplay between religious and existential well-being, fear of progression, and hope can contribute valuable insights to improve the support and care provided to individuals facing cancer diagnoses. By examining the relationships between these specific variables, the study contributes to the existing literature on the psychological aspects of cancer care. This could pave the way for further research and refinement of interventions in this domain.

Clinical and nursing implications

Study findings emphasize the importance of addressing patients' spiritual and existential well-being in addition to patients' physical health. By addressing patients' spiritual and existential needs, healthcare providers can support patients' hope and quality of life, which may contribute to better health outcomes. This study highlights the importance of a holistic approach to patient care that addresses all aspects of a patient's well-being, including their spiritual and existential needs.

In conclusion, the study findings suggest that religious well-being, hope, and fear of progression are important factors in the quality of life of patients with cancer. The results of the direct effect showed that religious well-being and hope, and hope and quality of life, have a significant positive relationship, while fear of progression and hope have a significant negative relationship. However, the study failed to support the hypothesis of a significant positive relationship between existential well-being and hope. The indirect effects of hope in the relationship between religious well-being and quality of life, and between fear of progression and quality of life, were supported, but the indirect effect of hope in the relationship between existential well-being and quality of life was not supported. The mediation model explained 9% of the total variance of hope and 12% of the total variance of quality of life. These findings suggest that addressing religious well-being, hope, and fear of progression may be important in improving the quality of life of patients with cancer.

Author Contribution Statement

All authors contributed equally in this study.

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Approv

The proposal of this study was approved by student research committee of Mazandaran university of medical sciences (Sari, Iran) (proposal code: 18690).

Data Availability Statement

Data is available on demand by reaching out to the author Amir Hossein Goudarzian by email at: amir_sari@yahoo.com.

Ethics approval statement

The ethical committee of the Mazandaran University of Medical Sciences approved the study (ethical code: IR.MAZUMS.REC.1402.478). All the participants signed the written consent forms. All the participants were assured regarding their privacy in this study and informed about volunteer entering the study and willingness to exclude from the study at any time.

Conflict of interest

Conflict of interest There are no conflicts of interest by any of the authors of this study. All authors have participated in (a) conception and design, or analysis and interpretation of the data; (b) drafting the article or revising it critically for important intellectual content; and (c) approval of the final version. This manuscript has not been submitted to, nor is under review at, another journal or other publishing venue. The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

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