

## Original Article



# Meaning in Life and Its Relationship with Life Expectancy in Patients Undergoing Chemotherapy: A Cross-Sectional Study

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**Abstract**

**Introduction:** Chemotherapy has a significant impact on the mental and emotional state of patients. Meaning in life is an important factor in maintaining and promoting mental and physical health. This study aimed to determine meaning in life and its relationship with life expectancy in patients undergoing chemotherapy.

**Methods:** This cross-sectional study was conducted in 2022. The study population was 180 patients undergoing chemotherapy referred to Tohid Hospital in Sanandaj, Iran who were selected by the convenience method. Data collection tools in this study were Steger's Meaning in Life questionnaire and Snyder's hope scale. Data were analyzed using STATA software version 12 and Mann-Whitney, Kruskal-Wallis and, Spearman correlation coefficient tests.

**Results:** The results showed that more than half of the patients felt meaningful and purposeful in life (56.11%) and 46.11% of them were actively searching for meaning in life. Most patients (73.33%) had low life expectancy. Life expectancy had a positive and significant relationship with the presence of meaning and the search for meaning in life ( $P < 0.05$ ). Life expectancy had a significant relationship with the variables of age, occupation, place of residence, education, financial status, type of health insurance, and type of cancer ( $P < 0.05$ ).

**Conclusion:** Based on the results, the life expectancy of patients should be strengthened, and in this way, special attention should be paid to the demographic characteristics and type of cancer of the patients. Nurses' spiritual support for patients and the implementation of programs to improve meaning in life are also recommended.

**Keywords:** Cancer, Life, Life expectancy, Chemotherapy

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**Introduction**

The first cause of death in developed countries and the second cause of death in developing countries is cancer.<sup>1</sup> In 2020, about 19.3 million new cases of cancer and 10 million deaths from cancer occurred in the world, the most diagnosed cases are breast cancer and the most deaths from cancer are due to lung cancer.<sup>2</sup> Cancer is the second non-communicable chronic disease in Iran, and it is the third cause of death after heart diseases and accidents.<sup>3</sup> In Iran, most cases of cancer and deaths related to it in men are related to stomach cancer, and in women, it is related to breast cancer.<sup>2</sup>

The goal of cancer treatment is to prolong the life

of patients and improve their quality of life. Cancer treatment has a positive effect on reducing the symptoms or slowing down the progression of disease symptoms, and in this sense, it can improve the quality of life.<sup>4</sup> Cancer treatment methods include surgery, radiotherapy, and systemic treatment. In mild cases and in the early stages of the disease, usually only surgical treatment is used, but in many cases, a combination of treatment methods is used. In metastatic cancers, the main method of treatment is the systemic method. The systemic method includes hormonal treatment, targeted treatment, immunotherapy, and chemotherapy.<sup>5</sup>

In cancer, due to mutations in proto-oncogenes and



tumor suppressor genes, cell division goes out of control and the changes created prevent cell death, but the cytotoxic properties of chemotherapy drugs cause cell death by apoptosis or direct effect on the DNA of cells or effect on vital proteins in cell division. In addition to affecting cancer cells, these drugs also cause the death of healthy cells, and the side effects of these drugs, such as fatigue, nausea, vomiting, hair loss, and even death, are caused by their effects on healthy cells, especially those which are more active such as bone marrow cells and mucous membranes. Apart from nausea, vomiting, and acute gastrointestinal cholinergic effects, the most common side effects of chemotherapy are due to its cytotoxic effects on cells with normal cell division.<sup>5,6</sup>

Having cancer causes disturbances in the social functioning and daily activities of patients and increases their physical, psychological, spiritual, and emotional needs.<sup>7</sup> These patients feel lonely due to frequent hospitalizations, and as a result of the changes caused by the diagnosis of cancer, the patient suffers a crisis, which increases the risk of mental disorders.<sup>8</sup> Also, the results of Demirtaş's study show a high prevalence of negative mental states in cancer patients.<sup>9</sup> Among the negative results of this disease, hopelessness is the most important issue in the early stages of treatment.<sup>10</sup>

Having cancer is a very important obstacle to increasing the level of life expectancy.<sup>2</sup> Snyder's theory states that despair is a state with a feeling of helplessness and disinterest in life.<sup>11</sup> Disappointment makes life aimless and this situation is related to depression, death wish, and suicide because it reduces the quality of life.<sup>12</sup> Life expectancy makes it easier for the patient to endure long and painful cancer treatments and it can also relieve pain by changing the body's biology<sup>13</sup> and even increases the probability of successful treatment and the speed of recovery.<sup>10</sup> Hopeful people are less distressed when faced with problems, and their ability to adapt to problems is greater.<sup>12</sup>

Snyder introduces hope as one of the components of meaning in life.<sup>14</sup> Meaning in life is considered an important variable in maintaining and improving the level of physical and mental health.<sup>15</sup> A number of empirical studies express the feeling of being purposeful and having a goal as meaning in life.<sup>16</sup> Low levels of meaning in life cause hopelessness, fatigue, and wish to die, especially in patients who are in the final stages of their lives. However, the existence of higher levels of meaning in life increases the ability of a person to adapt to stress, reduces the probability of macroscopic stroke, reduces depression after traumatic events, and reduces mortality in the elderly population.<sup>17</sup> The result of Hassankhani's study that compared the meaning in life between cancer patients and their families shows that the meaning in life is reduced in these patients.<sup>16</sup> In Moghtader's study that compared the life expectancy of women with breast cancer to healthy women, it was stated that the life expectancy of these patients is lower.<sup>10</sup>

In previous studies, the existence of a positive relationship between these two variables has been pointed out,<sup>18,19</sup> but these concepts can be influenced by culture, social conditions, and the health status of people. Therefore, considering the importance of the concepts of life expectancy and meaning of life, especially in cancer patients, the present study was conducted with the aim of determining the meaning in life and its relationship with life expectancy in chemotherapy patients referred to Tohid Hospital in Sanandaj.

## Methods

This cross-sectional study was conducted in 2022 in Kurdistan province in western Iran. The study population included 180 cancer patients undergoing chemotherapy referred to Tohid Hospital in Sanandaj, and sampling was done using the convenience method. After receiving the code of ethics from the Kurdistan University of Medical Sciences and obtaining informed consent from the patients, information was collected. Inclusion criteria included: age over 18 years, definitive diagnosis of cancer at least 3 months ago,<sup>16</sup> being aware of having cancer, undergoing chemotherapy, no death of relatives in the last 6 months, not having a known mental problem, and willing to participate in the study, and the exclusion criteria were incomplete completion of the questionnaires.

According to the results of the study by Mostarac<sup>20</sup> based on the Pearson correlation coefficient between meaning in life and life expectancy equal to 0.24 and considering the confidence level of 95% and the power of the test of 90% of the sample size using the following sample size formula

$$\left( n = \frac{\left( Z_{1-\frac{\alpha}{2}} + Z_{1-\beta} \right)^2}{\omega^2} + 3 \text{ and } \omega = \frac{1}{2} \ln \left( \frac{1+r}{1-r} \right) \right)$$

It was calculated to be 180 people.

The data was collected by the first author by referring to the setting of the study and distributing the questionnaires to the eligible patients. Information was collected through a 4-part questionnaire including demographic variables, clinical variables, meaning in life questionnaire, and Snyder's hope scale.

Demographic variables included: age, gender, marital status, occupation, place of residence, education level, financial status, and type of health insurance, and clinical variables included: type of cancer, stage of cancer, grade of cancer, and time since diagnosis of cancer.

The meaning in life questionnaire of Steger includes 10 questions in 2 subscales of the presence of meaning in life and the search for meaning in life, each of these subscales includes 5 questions. Answers to questions are based on a 7-point Likert scale, and each question is scored from 1 to 7. The options are completely true (score 7), mostly true (score 6), somewhat true (score 5), cannot say true or false (score 4), somewhat false (score 3), mostly false (score 2), and it is completely incorrect (score 1). Question number

9 was scored in reverse. The range of scores for each dimension is from 5 to 35. A score greater than 24 in the presence of meaning dimension indicates the feeling of meaning and purpose in one's life, and a score less than 24 in this dimension indicates the absence of meaning and purpose in life; Also, a score greater than 24 in the search for meaning dimension indicates that a person is actively searching for meaning in his life, and a score less than 24 in this dimension means not searching for meaning in life.<sup>21</sup> Steger et al. (2006) reported the alpha coefficient of the subscales of the questionnaire between 0.82 and 0.87, and after one month in retesting, the alpha coefficient of the presence of meaning subscale was 0.7 and the search for meaning subscale was 0.73.<sup>22</sup> In Iran, the validity of this questionnaire was evaluated and it was acceptable.<sup>23</sup> In order to check reliability, this questionnaire was given to 30 patients who did not participate in the research, and Cronbach's alpha coefficient was 0.98.

The hope scale was designed by Snyder.<sup>24</sup> It includes 12 questions in 3 sections of agency, pathways, and filler questions. The total score obtained in this questionnaire is the sum of the score of 4 questions of agency and 4 questions of pathways. Filler questions are not scored and are only to increase the accuracy of the questionnaire. This questionnaire is rated with an 8-point Likert scale from completely disagree (score 1) to completely agree (score 8) and its minimum and maximum points are 8 and 64. A score of 50 or less is considered as a low hope level and a score greater than 50 is considered as a high hope level. The psychometric and reliability of this questionnaire in Iran was reported by Kermani et al. (2013) with the Cronbach's alpha method of 0.86 and through retesting as 0.81, which indicates the good reliability and validity of this questionnaire in Iran.<sup>18</sup> In order to check the reliability, this questionnaire was given to 30 patients who did not participate in the research and Cronbach's alpha coefficient was 0.9.

### **Ethical Considerations**

In order to conduct the study, after obtaining the letter of introduction, the oncology departments of Tohid Hospital were referred. In order to conduct the research, permission was obtained from the authorities of the research environment, and data collection was done accurately. Before conducting the research, the objectives of the study were explained to the subjects and it was stated that participation in the research is optional and the financial burden is not imposed on the patient and their family. The principle of secrecy and confidentiality was explained to the patients and respected, and an anonymous questionnaire was used. Written consent was obtained from the research units, and the research was conducted away from any special tendencies and with impartiality, finally, honesty and scientific trust were observed in the writing of scientific texts.

### **Statistical Analysis**

STATA software version 12 was used to analyze the

study data. First, the frequency distribution table was calculated for the qualitative variables, and the mean and standard deviation were estimated for the quantitative variables. Then Mann-Whitney, Kruskal-Wallis and Spearman's correlation coefficient were used to examine the relationship between demographic, clinical, life expectancy and meaning in life variables.

### **Results**

Out of 180 patients who participated in this study, 84 (46.67 %) were women. The average age of the patients was  $55.09 \pm 12.83$ . 158 people (87.78%) are married, 104 people (57.78 %) are unemployed, 117 patients (65%) were city residents, and 96 patients (53.33 %) were illiterate. In terms of financial status, the income of 110 patients (61.11 %) was less than their expenses. 67 people (37.22 %) had social security insurance. The average duration of cancer diagnosis in patients was  $14.76 \pm 13.52$ . In relation to the type of cancer, 63 (35%) of the patients had cancers related to the digestive system, 33 (18.33 %) had breast cancer, 31 (17.22 %) had cancers of the circulatory system, 23 (12.78 %) had respiratory system cancers, 15 (8.33 %) had genitourinary system cancers, 8 (4.44 %) had musculoskeletal system cancers, 3 (1.67 %) had nervous system cancers, 3 (1.67 %) had endocrine system cancers, and 1 (0.56 %) had integumentary system cancers (Table 1).

The meaning in life questionnaire had two dimensions: the presence of meaning in life and the search for meaning in life, where 101 (56.11%) of the participants felt meaningful and purposeful in life, and 97 (53.89%) were not searching for meaning in life. The results of the hope scale showed that 132 patients (73.33%) had low life expectancy (Table 2).

In examining the relationship between life expectancy and meaning in life and demographic and clinical characteristics using univariate logistic regression, the results showed that life expectancy has a positive and significant relationship with the presence of meaning and the search for meaning in life ( $P < 0.05$ ). That means that the higher the life expectancy, the more meaningful and purposeful a person's life will be and the more they searches for meaning in life; Also, there was a significant relationship between life expectancy with the variables of age, occupation, place of residence, education (diploma, associate degree and bachelor), financial status (income equal to expenses), type of health insurance and type of cancer (circulatory system and musculoskeletal system). There was an inverse relationship between life expectancy and age of patients (Table 3).

In examining the relationship between life expectancy and meaning in life and demographic and clinical characteristics using multiple logistic regression, the results showed that life expectancy has a positive and significant relationship with the presence of meaning and the search for meaning in life ( $P < 0.05$ ). Also, there is a significant relationship between life expectancy and

**Table 1.** Frequency distribution of demographic and clinical characteristics of people participating in the study

Variables		N	Percent	
Gender	Female	84	46.67	
	Male	96	53.33	
Marital status	Married	158	87.78	
	Single	22	12.22	
Occupation	Employee	13	7.22	
	Self-employed	46	25.56	
	Retired	17	9.44	
	Unemployed	104	57.78	
Place of residence	City	117	65	
	Village	63	35	
Education level	Illiterate	96	53.33	
	High school	46	25.56	
	Diploma	19	10.56	
	Associate degree	5	2.78	
	Bachelor	12	6.67	
	Master	2	1.11	
Financial status	Income less than expense	110	61.11	
	Income equal to expense	61	33.89	
	Income more than expense	9	5	
Type of health Insurance	Health insurance	4	2.22	
	Social Security	67	37.22	
	Supplemental insurance	7	3.89	
	Other	94	52.22	
	None	8	4.44	
Cancer type	Digestive system	63	35	
	Circulatory system	31	17.22	
	Nervous system	3	1.67	
	Respiratory system	23	12.78	
	Musculoskeletal system	8	4.44	
	Endocrine system	3	1.67	
	genitourinary system	15	8.33	
	Integumentary system	1	0.56	
	Brest cancer	33	18.33	
Cancer stage	I	11	6.11	
	II	79	43.89	
	III	46	25.56	
	IV	44	24.44	
Cancer grade	Low	54	30	
	Moderate	72	40	
	High	54	30	
	mean	Sd	min	Max
Age	55.09	12.83	20	86
Time since diagnosis (months)	13.52	14.76	3	72

the variables of place of residence, education (master's), financial status (income more than expenses), type of cancer (musculoskeletal system, genitourinary system) and disease stage (IV). In the multiple regression model,

**Table 2.** Meaning in life and life expectancy in people participating in the study

Variables		N	Percent
Presence of meaning	Absence of feeling meaning	79	43.89
	Feeling meaning	101	56.11
Search for meaning	Non-active	97	53.89
	Active	83	46.11
Hope for life	Low hope	132	73.33
	High hope	48	26.67

the adjusted R<sup>2</sup> adjusted was equal to 0.74, which shows that the logistic regression model is well fitted and the entered variables explain well the life expectancy of cancer patients (Table 4).

### Discussion

In this study, the meaning in life was examined in two dimensions, the presence of meaning and the search for meaning, and the results showed more than 50% of patients felt meaningful in life (56.11%) and 46.11% actively sought meaning. 73.33% had low life expectancy. Life expectancy was related to the presence and search for meaning in life ( $P < 0.05$ ). Also related to age, occupation, residence, education, finance, health insurance, and cancer type ( $P < 0.05$ ). The fact that the majority of patients know the meaning of their lives and have goals in their lives, but are not looking for new goals, can indicate their low life expectancy as a result of having cancer and undergoing treatments. Balochi et al. stated in a study that some components of life meaningfulness are effective in reducing the psychological problems of colon cancer patients.<sup>25</sup> Also, in the study of Aghili et al., the results show the positive effect of meaning therapy on reducing pain and increasing life expectancy of women with breast cancer.<sup>19</sup> According to these results, in order to improve the mental and psychological condition of the patients, it is recommended that meaning therapy training courses be held for the nurses of the oncology department, so the patients can receive psychological support each time they are hospitalized for chemotherapy, and as a result their worries will decrease and gradually their hope to continue living will increase; Also, the presence of a psychologist and psychiatric counseling in the patient care team can be effective in reducing their psychological problems.

The results of this study show the low level of life expectancy in patients, which shows that patients' views on the possibility of recovery and regaining their health are negative, and for this reason, they stop trying to achieve their goals. The result of Li et al.'s study shows that life expectancy in women with breast cancer who are undergoing chemotherapy is in the medium range,<sup>26</sup> but the results of Ozen et al.'s study show that people with cancer have a high level of hope.<sup>27</sup> This difference in the results of the studies can be due to the different inclusion and exclusion criteria or because of the difference in the location of the research. Nurses of oncology departments

**Table 3.** Relationship between life expectancy and meaning in life and demographic and clinical characteristics using univariate logistic regression

Variables	OR (95% CI)	SE	z	P Value	
Presence of meaning	67.88 (9.08, 507.11)	69.65	4.11	0.000	
Search for meaning	37.10 (10.86, 126.68)	23.24	5.77	0.000	
Age	0.93 (0.90, 0.96)	0.01	-4.45	0.000	
Time since diagnosis	0.99 (0.97, 1.02)	0.01	-0.18	0.861	
Gender	Female	-	-	-	
	Male	1.31 (0.67, 2.56)	0.49	0.81	0.418
Marital status	Married	-	-	-	
	Single	0.78 (0.27, 2.26)	0.42	-0.45	0.656
Occupation	Employee	-	-	-	
	Self-employed	0.11 (0.02, 0.49)	0.08	-2.90	0.004
	Retired	0.12 (0.02, 0.65)	0.10	-2.46	0.014
	Unemployed	0.07 (0.01, 0.28)	0.05	-3.75	0.000
Place of residence	City	-	-	-	
	Village	0.39 (0.18, 0.85)	0.15	-2.36	0.018
Education level	Illiterate	-	-	-	
	High school	2.06 (0.86, 4.29)	0.91	1.64	0.101
	Diploma	4.25 (1.45, 12.45)	2.33	2.65	0.008
	Associate degree	8.78 (1.34, 57.39)	8.41	2.27	0.023
	Bachelor	29.28 (5.79, 148.06)	24.21	4.08	0.000
	Master	5.85 (0.34, 99.16)	8.45	1.22	0.221
Financial status	Income less than expense	-	-	-	
	Income equal to expense	4.05 (1.98, 8.29)	1.47	3.84	0.000
	Income more than expense	2.55 (0.58, 11.17)	1.92	1.25	0.213
Type of health Insurance	Health insurance	-	-	-	
	Social Security	0.15 (0.01, 1.55)	0.18	-1.59	0.112
	Supplemental insurance	0.14 (0.03, 6.70)	0.61	-0.59	0.558
	Other	0.06 (0.00, 0.65)	0.07	-2.32	0.020
	None	0.55 (0.03, 8.08)	0.75	-0.43	0.038
Cancer type	Digestive system	-	-	-	
	Circulatory system	3.98 (1.54, 10.24)	1.91	2.87	0.004
	Respiratory system	1.18 (0.36, 3.81)	0.70	0.28	0.782
	Musculoskeletal system	7.08 (1.48, 33.82)	5.65	2.45	0.014
	Endocrine system	8.50 (0.71, 101.64)	10.76	1.69	0.091
	genitourinary system	0.30 (0.03, 2.53)	0.32	-1.10	0.271
	Brest cancer	0.94 (0.31, 2.79)	0.52	-0.10	0.918
Cancer stage	I	-	-	-	
	II	0.71 (0.19, 2.69)	0.48	-0.49	0.624
	III	0.55 (0.13, 2.23)	0.39	-0.84	0.404
	IV	0.51 (0.12, 2.12)	0.37	-0.92	0.385
Cancer grade	Low	-	-	-	
	Moderate	0.79 (0.35, 1.74)	0.31	-0.58	0.563
	High	0.83 (0.35, 1.93)	0.35	-0.66	0.668

and other members of the treatment team should support patients by communicating closely with patients and explaining their life expectancy. Holding meetings with patients who have recovered from cancer can also help improve the life expectancy of patients.

The results of the present research highlight that there

is a positive and meaningful relationship between life expectancy and meaning in life. This finding is consistent with the results of Kermani et al.'s research, which also pointed to the positive relationship between these two variables.<sup>18</sup> Also, the result of Alagheband et al.'s study showed that life expectancy has a positive and significant

**Table 4.** Relationship of life expectancy with meaning in life and demographic and clinical characteristics using multiple logistic regression

Variables		OR (95% CI)	SE	z	P Value
Presence of meaning		63.68 (1.15, 3501.46)	130.20	2.03	0.042
Search for meaning		49.21 (2.10, 1152.74)	79.18	2.42	0.015
Age		0.87 (0.76, 1.00)	0.06	-1.93	0.053
Time since diagnosis		0.98 (0.92, 1.05)	0.03	-0.48	0.628
Gender	Female	-	-	-	-
	Male	0.14 (0.00, 3.37)	0.23	-1.20	0.230
Marital status	Married	-	-	-	-
	Single	0.42 (0.01, 12.17)	0.72	-0.50	0.614
Occupation	Employee	-	-	-	-
	Self-employed	0.01 (0.00, 7.98)	0.01	-1.44	0.149
	Retired	0.58 (0.00, 338.42)	1.90	-0.16	0.870
	Unemployed	0.01 (0.00, 5.13)	0.01	-1.55	0.122
Place of residence	City	-	-	-	-
	Village	0.08 (0.00, 0.94)	0.10	-2.01	0.045
Education level	Illiterate	-	-	-	-
	High school	0.87 (0.05, 13.94)	1.23	-0.09	0.927
	Diploma	1.66 (0.02, 116.02)	3.61	0.24	0.813
	Associate degree	0.47 (0.00, 55.45)	1.15	-0.30	0.761
	Bachelor	6.83 (0.01, 4316.94)	22.49	0.58	0.559
	Master	0.01 (0.00, 0.96)	0.01	-1.96	0.049
Financial status	Income less than expense	-	-	-	-
	Income equal to expense	3.11 (0.35, 27.18)	3.44	1.03	0.304
	Income more than expense	807.80 (3.48, 187044.1)	2244.08	2.41	0.016
Type of health Insurance	Health insurance	-	-	-	-
	Social Security	0.01 (0.00, 19.10)	0.01	-1.49	0.136
	Supplemental insurance	0.01 (0.00, 5.63)	0.01	-1.73	0.084
	Other	0.01 (0.00, 41.48)	0.02	-1.37	0.170
	None	0.04 (0.00, 17087.42)	0.29	-0.47	0.637
Cancer type	Digestive system	-	-	-	-
	Circulatory system	0.43 (0.02, 7.33)	0.62	-0.58	0.546
	Respiratory system	0.20 (0.00, 7.48)	0.37	-0.87	0.386
	Musculoskeletal system	554.95 (5.25, 58582.71)	1319.25	2.66	0.008
	Endocrine system	2.10 (0.01, 459.25)	5.78	0.27	0.787
	genitourinary system	0.01 (0.00, 0.22)	0.01	-2.62	0.009
	Brest cancer	0.15 (0.01, 3.01)	0.23	-1.24	0.216
Cancer stage	I	-	-	-	-
	II	0.17 (0.00, 11.43)	0.36	-0.82	0.410
	III	0.02 (0.00, 1.47)	0.03	-1.79	0.073
	IV	0.01 (0.00, 0.88)	0.02	-2.01	0.045
Cancer grade	Low	-	-	-	-
	Moderate	24.19 (0.75, 770.72)	42.73	1.80	0.071
	High	7.04 (0.28, 173.19)	11.51	1.20	0.232

relationship with quality of life.<sup>28</sup> The results of Wang et al.'s study also point to a positive and significant relationship between life expectancy and meaning in life with post-traumatic growth in patients with COPD.<sup>29</sup> In the study of Hassankhani et al., who compared the meaning in the life of cancer patients with their family

members, the results showed a significant difference between the scores of these two groups, and the scores of the patients were much lower than their families.<sup>16</sup> In a systematic review study, Quinto et al. investigated meaning in life and acceptance of cancer, and the result of this study points to a positive relationship between

these two variables.<sup>30</sup> The results of Gravier et al.'s study also showed that meaning in life in cancer patients has no meaningful relationship with the country of residence.<sup>17</sup> Therefore, paying more attention to communicating with cancer patients, as well as explaining the treatment and recovery process by the care team and the cooperation of psychologists and religious missionaries according to the patient's preference, in order to improve the meaning of life of cancer patients, can provide an opportunity to improve their life expectancy.

It is evident from the findings that there is a significant and inverse relationship between age and life expectancy in patients undergoing chemotherapy, which means that life expectancy decreases with increasing age in these patients. The results of Erçi et al.'s study showed that age is one of the predictors of meaning in life,<sup>15</sup> but in the study of Gravier et al., it was stated that age was not related to meaning in life.<sup>17</sup> In the study of Li et al., who examined hope in women with breast cancer undergoing chemotherapy, it was also mentioned that hope was higher in women aged 45 and younger.<sup>26</sup> In another study, the inverse and significant relationship between hope and age has been mentioned.<sup>27</sup> It seems that the weakness and incapacity due to aging, cancer, undergoing chemotherapy and the complications caused by the treatment have reduced the hope of patients to recover and continue living, also elderly people due to their limited information about cancer and its treatment and considering cancer as an incurable disease have a lower hope of recovery and continued life. As nurses, we can encourage patients to express their feelings and fears in relation to the disease and treatment, in this way, we can evaluate their knowledge and level of information about their disease and give them true information about it, we can also encourage patients to communicate with other cancer patients who have a similar condition because knowing that there are other people with the same condition gives hope for recovery.

In the current study, there is a positive and significant relationship between the level of education and life expectancy. In the study of Gravier et al.<sup>17</sup> and the study of Erçi et al.<sup>15</sup> the meaningful relationship between education and meaning in life is also mentioned. Li et al.<sup>26</sup> and Ozen et al.<sup>27</sup> also pointed out a positive relationship between education level and life expectancy. In another study that investigated the predictors of hope in patients with colorectal cancer, 2 years after cancer diagnosis, education was also stated as one of the predictors of hope,<sup>31</sup> but in another study, it has been found that education has no effect on patients' hope for recovery.<sup>32</sup> Having a higher level of education can provide the basis for obtaining new and up-to-date information, Therefore, people with higher education have a better understanding of their illness and its treatment, which can increase their life expectancy. Considering that more than half of the patients who participated in this study were illiterate and did not have enough and correct information about the

disease, we as nurses should try to use simple words and sentences to provide correct and sufficient information to these patients. We should remove the misconceptions that exist in the minds of patients by doing this, and increase their life expectancy.

According to the findings of the present study, there is a positive and significant relationship between life expectancy and financial status, but the results of Baczevska et al.'s study show that there is no significant relationship between financial status and hope for recovery.<sup>32</sup> In a study, Jim et al. also pointed out the absence of a significant relationship between meaning in life and the amount of income.<sup>33</sup> But in the study of Hassankhani et al.<sup>16</sup>, Gravier et al.<sup>17</sup> and Erçi et al.<sup>15</sup> the presence of a positive and, significant relationship between meaning in life and financial status was mentioned. The presence of a positive and significant relationship between life expectancy and financial status indicates the importance of income as one of the factors affecting life expectancy in cancer patients. Cancer has many consequences on all aspects of an individual's life and their family, and its treatment requires a long process, which is a confirmation that the treatment process is costly, and families who do not have a favorable financial situation experience more anxiety, And the patient will not have hope to continue living and sometimes they wish to die. Therefore, introducing these people to institutions for financial support can be effective in improving their life expectancy, also emotional and psychological support for these patients is one of the main duties of the treatment staff, especially nurses in chemotherapy departments.

The current study's findings indicate a strong correlation between the type of cancer, place of residency, and life expectancy. Patients' access to medical care is directly correlated with where they live. The lack of treatment facilities in rural areas makes patients more anxious and stressed when experiencing side effects of chemotherapy, such as nausea, vomiting, weakness, and lethargy. Patients who have cancer and receive chemotherapy also experience changes in their look, which can vary in degree according to the type of cancer and the body areas affected. These changes in appearance can lead to a poor body image in this group of people. Patients with this body image issue might experience a shorter life expectancy.

There were also limitations in this study, such as the fact that a limited number of patients were examined, and because many of the patients who participated in this study were old and illiterate, the questionnaires were read to them. Also, because there was more than one patient in each room and it was not possible to provide a private environment, there is a possibility that patients did not respond truthfully in some cases. In interviews with patients to complete the questionnaires, the impact of their religious beliefs on their mental and emotional state was significant, and for a more detailed investigation, the impact of religious beliefs of patients on their life expectancy and meaning in their lives can be investigated

in future studies.

### Conclusion

The results of this study showed a significant relationship between life expectancy and meaning in life in patients undergoing chemotherapy and that factors such as age, education, place of residence, financial status, type of cancer, and stage of the disease affect the life expectancy of patients. Therefore, it is important to pay special attention to the emotional and spiritual support of cancer patients in addition to physical care.

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### Competing Interests

The authors declare that there are no conflicts of interest.

### Ethical Approval

This study was approved by the Research Ethics Committee of Kurdistan University of Medical Sciences under the ethical code IR.MUK.REC.1401.238.

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