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Cancer patients' quality of life predicted by a healthy lifestyle and health literacy

Abstract

From a psychological point of view, the most critical issue in facing cancer is its approach to adaptation, which determines the patient's health and level of hope. The current research is predictive correlational. Its statistical population was all Imam Khomeini Hospital cancer patients in Koohdasht; it concluded that 160,000 cancer patients based on the volume of cancer statistics in Iran. The statistical sample (384 cancer patients) was selected through sampling at convenience and using the Morgan table according to the statistical population. Standard questionnaires were used in this research. It used descriptive and inferential statistics, including Pearson's test, multiple regression, and structural equations, using SPSS and LISREL software to analyze the data. The results showed that a healthy lifestyle and health literacy significantly affect the quality of life, so the share of a healthy lifestyle is 0.52%, and that of health literacy is 0.78%. The results of the conceptual model of structural equations showed that the direct and standardized effect of a healthy lifestyle (β=0.52, $p<0.01$) and health literacy (β=0.78, $p<0.01$) on Quality of life is significant and positive. Therefore, it is possible to create a healthy lifestyle and improve the health literacy of cancer patients because the patient's awareness of health conditions, advantages and disadvantages of different treatments, and their consequences improve patients' quality of life.

Keywords: *quality of life, healthy lifestyle, health literacy, cancer patients*

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Introduction

There is always a balance between the amount of cell division, natural cell death, and differentiation in a healthy organism. However, cancer is the abnormal growth of cells that can attack or spread to other body parts. It refers to a group of diseases arising from uncontrolled cell proliferation (1). In 2018, the researchers reported 18.1 million new cases of cancer and 9.6 million deaths from cancer (2). By 2030, the global cancer problem will probably take an upward course due to population growth on the one hand and population aging on the other (3). Quality of life and individuals' assessment of their quality of life has recently gained much attention. As some researchers at the University of Toronto have said (2015), the level of people's enjoyment of life and their satisfaction with being alive is the most significant opportunity and potential for them to enjoy a happy life and physical and mental health. Quality of life is a complex issue (4), and it is not easy to provide a clear definition of quality of life. However, it is supposedly the best measure of an individual's ability to adapt successfully to the challenges of the natural world (5).

One of its influential components is a healthy lifestyle. A healthy lifestyle is a multi-causal and multi-dimensional phenomenon of collective behavioral patterns usable for preventing health-related problems and ensuring a person's health.

All actions, activities, and behaviors that reduce exposure to disease in people are the symptoms of a healthy lifestyle. These behaviors include proper diet, sleep and activity, exercise and weight control, not smoking, alcohol, drugs, and immunization (6).

Cancer prevention comprehends primary prevention (prevention of the disease) and secondary prevention (early diagnosis). As for the primary prevention of cancer, it is necessary to know the causes and factors involved in cancer occurrence. Clear is the role of lifestyle in the incidence of cancer in different nationalities and the difference in its incidence before and after immigration, so cancer prevention is possible mainly by modifying lifestyle (7). According to the results, exercise has encouraging effects on sleep disorders and quality of life in cancer patients (8).

Another variable that can affect the quality of life is health literacy. Health literacy as a new concept has given more credibility to educational interventions in recent years. Health literacy is the ability to receive, process, and understand health information and services to make appropriate health decisions. Therefore, health literacy comprehends not only reading and writing skills but also a wide range of understanding of health information to perform healthy behaviors (9). Individuals with poor health literacy supposedly have less knowledge about health, receive fewer preventive services, have more problems in controlling chronic diseases, and have poorer performance in providing physical and mental health and hospital services are more among them (10). The results of studies in Sweden have shown that a lack of knowledge about the disease and its treatment and complications reduces the quality of life of these patients, their families, and the individuals with more knowledge. They can provide the resources needed to cope with the effects of the disease, including psychological, physiological, and social reactions (9).

In addition, disease consciousness affects cancer patients' quality of life (11). A study was conducted on the quality of life during cancer treatment. The result showed that it is very painful and difficult to diagnose cancer as a disease that has long-term effects on these patients' mental health and quality of life (12).

The level of health literacy, in particular, can play a role in cancer outcomes. New patients may receive unfamiliar technical information about their diagnosis. Healthcare professionals often involve patients in choosing complex treatment options. Therefore, people with low health literacy are deprived of appropriately receiving, processing, and understanding was written and oral information about cancer (13). Therefore, considering the complex and challenging conditions of cancer patients, researchers have tried in recent years to investigate the related factors and the quality of life of cancer patients. Our research has attempted to answer whether cancer patients' healthy lifestyles and health literacy predict their quality of life.

Methodology

The current research is predictive correlational. Its statistical population was all cancer patients of Imam Khomeini Hospital in Koohdasht. Cancer patients are 160,000 people based on the volume of cancer statistics in Iran. The sampling selected the statistical sample (384 cancer patients) conveniently and through the Morgan table according to the statistical population. The inclusion criteria in this research were 1- Patient satisfaction, 2- Without mental illness, and 3- Treatment only at Imam Khomeini Hospital in Koohdasht. Exclusion criteria were 1- lack of patient satisfaction, 2- history of mental illness, and 3- treatment in other hospitals. The researcher contacted the patients after obtaining permission from Imam Khomeini Hospital in Koohdasht and the approval of the relevant authorities. Necessary explanations were given to the participants due to compliance with ethical standards, and they were assured that their information was confidential. If any participants needed help, they would be given the necessary explanations, and their problems would be solved. In the end, they were thanked for participating in this research. Three questionnaires were usable for conducting the present research as follows. *Weir and Sherburne Quality of Life Questionnaire (1996):* Weir and Sherburne (1996) created this self-report questionnaire. It has 36 expressions and evaluates eight domains of physical functioning, social functioning, playing physical roles, emotional roles, mental health, vitality, physical pain, and general health. The subject's score in each area ranges from 0 to 100; a higher score means a better quality of life. The validity and reliability of this questionnaire have been confirmable in the Iranian population, the internal consistency coefficients of its eight subscales were between 0.70 and 0.85, and their retest coefficients with an interval of one week were between 0.43 and 0.79. (14 and 15). *Walker et al.'s health lifestyle questionnaire (1987):* Walker et al. designed 1987 the health-promoting lifestyle questionnaire. This questionnaire contains 52 expressions that measure six dimensions. This tool measures health-promoting behaviors in 6 dimensions. Nutrition (6 questions on having a food pattern and choosing food), exercise (5 questions on following a regular exercise pattern), responsibility for health (10 questions), stress management (7 questions on Identifying sources of stress and stress management measures), interpersonal support (7 questions on maintaining relationships with a feeling of closeness), and self-actualization (13 questions on having a purpose, seeking individual development, experiencing self-awareness and satisfaction). The questions show positive actions and perceptions to increase health and well-being. In general, the health-promoting lifestyle score and the behavioral dimensions score are calculable by the average answers for all 52 questions and each sub-category (8-9 items). Walker et al. reported a Cronbach's alpha of 0.94 for this tool and a range of 0.79 to 0.94 for its six sub-categories. The 3-week test-retest reliability for the whole tool was equal to 0.89 (16). *Health Literacy Questionnaire of Montazeri et al. (2013):* Montazeri et al. designed 2013 the health literacy questionnaire, which includes 33 items and five components. The components are accessed, including items 1 to 6, reading skills with items 7 to 10, understanding with items 11 to 17, evaluation with items 18 to 21, and decision-making and application of health information with items 22 to 33. Montazeri et al. (2013) estimated the reliability of the questions of this questionnaire by 0.89 (17). Descriptive statistics (mean, median, etc.) and inferential statistics, including Pearson's test, multiple regression, and structural equations, were used for data analysis through SPSS and LISREL software.

Findings

Descriptive findings

Table 1: Descriptive findings of research variables

Variable	Mean	Median	Standard deviation	Variance	Minimum	Maximum
Quality of Life	136.98	137.50	24.342	592.550	70	194
Physical dimension	70.43	77.00	17.543	307.771	25	98

Psychological dimension	66.55	58.00	17.594	309.543	41	99
healthy lifestyle	134.01	133.00	13.654	186.444	94	176
Nutrition	19.33	20.00	3.487	12.160	12	25
Sport	15.48	15.00	2.999	8.992	9	34
Responsibility for health	24.28	25.00	6.596	43.504	12	39
Stress management	20.59	21.00	4.494	20.180	12	28
Interpersonal support	20.85	21.00	4.281	18.329	12	28
self-actualization	33.47	33.00	9.743	94.934	18	50
Health literacy	109.44	108.50	14.783	218.540	78	154
Access	20.38	20.00	20.472	20.002	12	28
Reading skills	15.68	15.00	3.591	12.896	9	34
Understanding	21.47	21.00	5.372	28.861	12	35
Evaluation	15.52	15.00	3.012	9.070	9	20
Decision-making and use of health information	36.38	33.00	11.811	139.500	18	60

Based on Table 1, the statistical indicators for the variables and their components are clear.

Inferential findings

• Determining the assumption of normality of data distribution

Testing the research hypotheses

The first research hypothesis is a significant relationship between quality of life and healthy lifestyle in cancer patients.

Table 2: Pearson correlation coefficient test between the quality of life and healthy lifestyle

Variables	1	2	3	4	5	6	7	8	9	10
1- Quality of life	1	0.410**	0.612**	0.520**	0.317**	0.210**	0.486**	0.622**	0.256**	0.342**
2-Physical dimension	0.410**	1	0.125**	0.118**	0.425**	0.112**	0.653**	0.588**	0.402**	0.629**
3-Psychological dimension	0.612**	0.125**	1	0.140**	0.258**	0.212**	0.560**	0.149**	0.346**	0.389**
4-Healthy lifestyle	0.520**	0.118**	0.140**	1	0.526**	0.459**	0.680**	0.529**	0.349**	0.550**
5-Nutrition	0.317**	0.425**	0.258**	0.526**	1	0.202**	0.156**	0.241**	0.526**	0.524**
6- Sports	0.210**	0.112**	0.212**	0.459**	0.202**	1	0.118**	0.125**	0.258**	0.680**
7-Responsibility for health	0.486**	0.653**	0.560**	0.680**	0.156**	0.118**	1	0.325**	0.589**	0.472**
8- Stress management	0.622**	0.588**	0.149**	0.529**	0.241**	0.125**	0.325**	1	0.586**	0.315**
9-Interpersonal support	0.256**	0.402**	0.346**	0.349**	0.256**	0.258**	0.589**	0.586**	1	0.259**
10- Self-actualization	0.342**	0.629**	0.389**	0.550**	0.524**	0.680**	0.472**	0.315**	0.259**	1

** is significant at the 0.01 level.

In Table 2, the correlation coefficient between the quality of life and a healthy lifestyle is positive (0.520). It shows a significant relationship between quality of life and healthy lifestyle in cancer patients at the error level of 0.01 and with 99% confidence. It means that with the increase of healthy lifestyles in cancer patients, their quality of life increases and vice versa. The above table shows that the correlation coefficient between other variables is also positive and significant.

The second research hypothesis: There is a significant relationship between quality of life and health literacy in cancer patients.

Table 3: Pearson correlation coefficient test between the quality of life and health literacy

Variables	1	2	3	4	5	6	7	8	9
1- Quality of life	1	789**.0	562**.0	412**.0	477**.0	269**.0	458**.0	755**.0	652**.0
2-Physical dimension	789**.0	1	145**.0	352**.0	598**.0	755**.0	628**.0	521**.0	169**.0
3- Psychological dimension	562**.0	145**.0	1	180**.0	662**.0	512**.0	489**.0	289**.0	620**.0
4-Healthy lifestyle	412**.0	532**.0	180**.0	1	689**.0	725**.0	452**.0	612**.0	512**.0
5- Access	477**.0	598**.0	662**.0	668**.0	1	480**.0	555**.0	652**.0	521**.0
6- Reading skill	269**.0	755**.0	521**.0	725**.0	480**.0	1	322**.0	621**.0	412**.0
7- Understanding	458**.0	628**.0	489**.0	452**.0	555**.0	322**.0	1	865**.0	720**.0
8- Evaluation	755**.0	521**.0	289**.0	612**.0	652**.0	621**.0	865**.0	1	528**.0
9- Decision-making & Application of health information	652**.0	169**.0	620**.0	512**.0	521**.0	412**.0	720**.0	528**.0	1

** is significant at the 0.01 level.

In Table 3, the correlation coefficient between the quality of life and health literacy is positive (0.789). It shows a significant relationship between quality of life and health literacy in cancer patients at the error level of 0.01 and with 99% confidence. This means that with increased health literacy in cancer patients, their quality of life increases and vice versa. The above table shows that the correlation coefficient between other variables is also positive and significant.

The central hypothesis of the research: quality of life is predictable regarding a healthy lifestyle and health literacy in cancer patients.

Table 4: Summary of the regression model in terms of the variables in the primary hypothesis

Multiple correlation coefficient (R)		Coefficient of explanation (R^2)	Modified R^2	Standard error of estimation (S.E.E.)	
0.48		0.23	0.20	17.87	
Model	Total squares	Degree of freedom	Mean squares	F	Sig.
Regression	895.19918	4	556.2845	8.90	0.000
leftover	256.65893	379	671.319		
Total	152.84812	383			
Model				t	Significance level
	B	Std. Error	Beta		
Constant	35.11	60.8	-	34.3	000.0
Healthy lifestyle	51.0	42.0	52.0	20.2	002.0
Health literacy	82.0	34.0	78.0	10.5	000.0

According to Table 4, the value of the multiple correlation coefficient (R) calculated between the criterion variable entered into the model and the predicting variables is equal to 0.48, and the value of the explanatory coefficient is equal to 0.23. This means that about 23% of the changes in the criterion variable are explainable by these variables (healthy lifestyle, health literacy) entered into the model. The value of the adjusted explanatory coefficient is equal to 0.20. The obtained F (8.90) is significant at the significance level of 0.01. Finally, the regression analysis shows that a healthy lifestyle and health literacy significantly affect the quality of life, so the share of a healthy lifestyle is 0.52%, and that of health literacy is 0.78%.

Studying the conceptual model of research

Figure (1) presents the confirmatory factor analysis model of this section

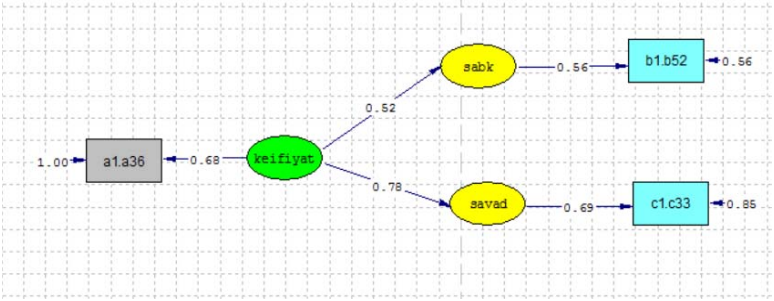

Figure 4-1: Research conceptual model, the results of the standardized regression coefficients of the model

- Fitting the structural equation model for examining research hypotheses

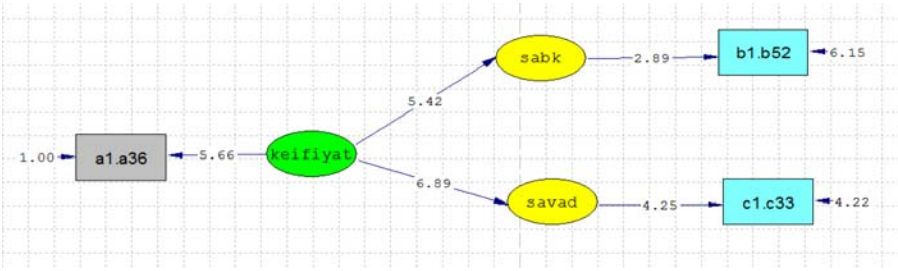

Figure 2: Research conceptual model and the t-value results of the model

Table 5: Standardized, direct, and total coefficients in the conceptual research model

Criterion variable	Predicting variable	Direct effect	Indirect effect	Total effect	Explained Variance
On the quality of life	healthy lifestyle	0.52	-	0.52	0.68
On the quality of life	health literacy	0.78	-	0.78	0.56

The results of the conceptual model showed that the direct and standardized effect of a healthy lifestyle (β=0.52, p<0.01) and health literacy (β=0.78, p<0.01) on quality of life is significant and positive so that healthy lifestyle and health literacy are of effect on the quality of life.

Discussion

Primary hypothesis: "Quality of life is predictable through healthy lifestyle and health literacy in cancer patients."

The results showed that a healthy lifestyle and health literacy significantly affect the quality of life, so the share of a healthy lifestyle is 0.52%, and that of health literacy is 0.78%. The results of the conceptual model of structural equations showed that the direct and standardized effect of a healthy lifestyle (β=0.52, p<0.01) and health literacy (β=0.78, p<0.01) on Quality of life is significant and positive. The results of this finding are in agreement with the research results of Onaq et al. (18), Eyni and Hashemi (3), Mousavi et al. (13), Farahbakhshbeh et al. (19), Jamshidi and Pasha (5), Piri et al. (7), Sanfat (20), Wang (21), Cogby (22), Clark (23), and Miller (24). What explains this finding is that despite medical advances, the development of cancer treatments is unique in terms of the feeling of helplessness and deep fear it creates in a person. Without a doubt, diagnosing life-threatening diseases like cancer affects people's quality of life. Different studies have identified different causes and factors for the occurrence and spread of cancer. However, regardless of the factors that cause it, psychologically, the most critical issue in facing this disease is approaching and adapting to it.

Based on the studies, 50-85% of cancer patients suffer from a psychiatric disorder. (25).

Undoubtedly, cancer susceptibility varies from one person to another due to differences in background and internal differences; in addition to hereditary characteristics, external factors significantly impact the occurrence of cancer. Behaviors, habits, and lifestyle can affect health. Smoking, drinking too much alcohol, or having a poor diet can contribute to poor health. Countries should try to encourage smokers not to smoke to reduce deaths. Many cancers are infection-related in low-income countries, particularly in Asia and South Africa. Physical activity/inactivity and diet can also affect the risk of cancer (7).

Moreover, it is necessary to have sufficient health literacy to make important health decisions and then maintain the health of society and increase the quality of life. The World Health Organization has introduced health literacy as an essential determinant of society's health. Most of the elderly have lower health literacy than other members of society, which negatively affects their health indicators. Patients with a low level of health literacy have difficulty understanding written medical information. They use fewer health and preventive services due to less sensitivity to health messages and have less knowledge of daily health behaviors. These people have less physical and mental health and are more prone to hospitalization (28). Likewise, compliance with treatment is weaker in these patients, and depression and mortality are higher in them. The low level of health literacy is a big obstacle in communication between the patient and the doctor and creates severe problems in following the treatment instructions and understanding the reason for the prescription of each drug by the physician (26).

The first sub-hypothesis: "There is a significant relationship between quality of life and healthy lifestyle in cancer patients." According to the results of the fourth chapter, the correlation coefficient between the quality of life and a healthy lifestyle (0.520) is positive. This shows a significant relationship between quality of life and healthy lifestyle in cancer patients at the error level of 0.01 and with 99% confidence. The results of this finding are in line with the research results of Piri et al. (7) and Sanfat (20). This explains that cancer susceptibility undoubtedly varies from one person to another due to the difference in background and internal differences. In addition to hereditary characteristics, external factors have a significant impact on the incidence of cancer. Behaviors, habits, and lifestyle can affect health. Smoking, drinking too much alcohol, or having a poor diet can contribute to poor health. Countries should try to encourage smokers not to smoke to reduce these deaths. In low-income countries, particularly in Asia and South Africa, infection constitutes a high proportion of cancers. Physical activity/inactivity and diet can affect the risk of cancer. The results of such research can provide suitable working procedures for preventing, controlling, and treating cancer. We can reduce the probability of cancer in society by using these working procedures and avoiding other cancer-related factors. The scientific community and experts in this field to increase public awareness, gain the support of policymakers and create inter-sectoral coordination for improving lifestyles, reducing risky behaviors, and dealing with water, air, and food pollution, are of strategic importance to fight cancer.

The second sub-hypothesis: "There is a significant relationship between quality of life and health literacy in cancer patients." According to the results of the fourth chapter, the correlation coefficient between the quality of life and health literacy (0.489) is positive. This shows a significant relationship between quality of life and health literacy in cancer patients at the error level of 0.01 and with 99% confidence. The results of this finding are in line with the research results of Hatam et al. (28), Cogby (22), Miller (24), and Razhnegi et al. (27).

This explains that many of the psychological and social problems and costs that diseases cause for people are solvable by providing health literacy education. Research has shown that having health literacy leads to the reduction of health inequalities among people, especially in developing countries. Because benefiting from health services, receiving these services timely and optimal use of health resources is possible only through health literacy and its presentation to society. Therefore, we can help improve people's lives by providing appropriate information and improving the level of health literacy in society. Thus, health literacy improves the lives of patients and helps them to benefit from the health service system. It helps their families to take effective steps to have a quality life.

It is recommendable, therefore, to provide more information and create a healthy lifestyle for the individuals, especially for the families of these patients, and care for these people to improve their quality of life. As another suggestion, health psychology interventions should be integrated into comprehensive programs and protocols that cover this part of patients' needs. It is evident that paying attention to this part of the patient's needs and developing the necessary protocols leads to a closer relationship between them and the health service providers. This is, in turn, a factor in the patient's awareness of the health conditions, advantages and disadvantages of different treatments and their consequences, and improving patients' quality of life, which is achievable by increasing health literacy.

Conclusion

This research results make it possible to create a healthy lifestyle and improve the health literacy of cancer patients because the patient's awareness of health conditions,

advantages and disadvantages of different treatments, and their consequences improve patients' quality of life.

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Conflict of interest

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Ethics statement

None.

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