



The structural model of health literacy on cancer autonomy in patients with cancer: The role of social support

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Original Article

Abstract

BACKGROUND: Health literacy is one of the important areas in research related to cancer and preventive behaviors that play an important role in improving health outcomes. The aim of this study was to investigate the structural pattern of health literacy on cancer self-efficacy with the mediating role of social support in cancer patients.

METHODS: The method of this research was cross-sectional modeling of structural equations. The statistical population included all female patients with breast cancer who referred to Shahid Rahimi Hospital of Khorramabad city, Lorestan, Iran, for follow-up treatment between the beginning of summer 2019 and the end of spring 2020, and 300 of them were selected using available sampling method. They then completed the Health Literacy Scale-Short Form (HLS-SF), Cancer Behavior Inventory-Brief Version (CBI-B), and the Social Support Questionnaire (SSQ). The collected data were analyzed using structural equation modeling in Amos statistical software.

RESULTS: The results of data analysis showed that health literacy and social support have a significant relationship with cancer self-efficacy. The results of modeling the structural equations showed the fit of the model with the experimental data. Health literacy had a significant direct effect on cancer self-efficacy ($P < 0.01$). Moreover, due to social support, health literacy had an indirect and significant effect on cancer self-efficacy ($P < 0.01$).

CONCLUSION: Health literacy and social support play an important role in increasing cancer self-efficacy in breast cancer patients.

KEYWORDS: Models, Structural; Health Literacy; Cancer; Social Support

Date of submission: 23 Aug. 2021, **Date of acceptance:** 08 Jan. 2022

Citation: Razavi R, Yaghoubi H, Ganji K, Khajvand Khoshli A. **The structural model of health literacy on cancer autonomy in patients with cancer: The role of social support.** Chron Dis J 2023; 11(4): 199-207.

Introduction

Breast cancer is one of the most common malignancies and one of the leading causes of cancer deaths in women globally and the average incidence of this disease ranges between 12% and 15% in the world.^{1,2} A cancer diagnosis is not only devastating news for those who receive the diagnosis, but also a

threatening event with negative consequences. Breast cancer is a major stressor for women and the cause of existential crisis in their lives. Women suffer from major social and economic stressors. Health literacy is an important area in cancer research and mediates health outcomes and preventive behaviors.^{3,4} Health literacy is the ability to access, process, and understand the basic health information and services needed to make appropriate health decisions. Health literacy is a determining factor in health

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outcomes. Low health literacy is associated with an increased risk of intensive care and hospitalization, poor adherence to treatment, and increased mortality.⁵ Health literacy plays an important role in health outcomes including health status, quality of life (QOL), evaluation of health information, following medical instructions correctly, understanding health messages, and timely hospitalization during illness, immunization, and screening.⁶ Patients with low health literacy report lower QOL and often suffer from chronic diseases more than the general population.⁷ Evidently, the relationship between knowledge and practice of health-oriented behaviors is not always direct and linear. Self-efficacy is one of the variables that mediate this relationship. Research by Huang et al. in 2018 has shown that there is a relationship between health literacy and self-efficacy. Self-efficacy is a key variable in behavior change and replacement of health-oriented behaviors. Self-efficacy and health literacy are two important categories in determining the ability of patients with chronic diseases to adhere to the treatment regimen.⁸ In many models proposed for the determination and defining of health literacy, self-efficacy has a special place. Self-efficacy is influential both in the acquisition of health-related knowledge and the sense of control over health and health-related decisions.⁹ Self-efficacy, which is a person's confidence in meeting the challenges posed by cancer, plays a central role in adapting to the disease. Cross-sectional research suggests that cancer-related self-efficacy is associated with a positive mood and higher QOL in these patients. Although much attention has been paid to the role of self-efficacy in coping with cancer, there is a lack of research on changing the level of self-efficacy according to the stage of the disease (diagnosis, treatment, and survival). A study by Rzonca et al. in 2018 on a group of cancer patients for 8 months showed that self-efficacy in self-care

decreases over time.¹⁰ Self-efficacy is considered a major psychological resource in the promotion of individuals' compatibility with physical illness. The results of the study by Farley in 2020 indicate the important role of self-efficacy in predicting psychological and functional outcomes in people with disabilities. Improving self-efficacy can increase QOL in patients who have to live with chronic diseases.¹¹ A practical point in the field of self-efficacy and teaching health behaviors in cancer patients is their shared experiences. With persistence in lifestyle changes, the belief is formed in these individuals that they will be effective in performing the activities needed for lifestyle change that can be adapted to them.¹² Satisfaction with relationships and having close friends reflects a person's social support. Social support plays an important role in coping and participation in the cognitive process allows the individual to observe the experiences of others, thus support is a social resource that increases self-efficacy.¹³ Lack of social support for patients with chronic diseases, including breast cancer, is associated with poor emotional well-being, increased depressive symptoms, and decreased QOL. Women in social isolation, who lack access to support from social sources such as family and friends, are at increased risk of death after being diagnosed with cancer due to pain, depression, and lack of emotional and psychological well-being. Breast cancer patients with low social support experience more anxiety and depression.³ Research suggests a direct link between health literacy and cancer self-efficacy. There is also a direct relationship between health literacy and social support, and self-efficacy and social support.¹⁴⁻²⁰

Due to the very limited number of research conducted in Iran to identify factors related to cancer self-efficacy in general and the limitation of psychological models for self-

efficacy in breast cancer patients, the knowledge gap in this area of research was the main reason for performing the present study. Therefore, this study was conducted to investigate the direct and indirect relationships between health literacy and cancer self-efficacy, considering the mediating role of social support. Moreover, the proposed model on breast cancer has not been studied so far, which shows the importance of addressing this issue. Therefore, the aim of this study was to investigate the structural pattern of health literacy on cancer self-efficacy with the mediating role of social support in cancer patients.

Methods

The research method used was cross-sectional modeling of structural equations. The study population included all women with breast cancer in Khorramabad city, Lorestan province of Iran, who referred to the oncology ward of Shahid Rahimi Hospital of Khorramabad for follow-up treatment from the beginning of summer 2019 to the end of spring 2020. Using available sampling method, 300 women were selected as the study participants.

The data collection tools used included a demographic information questionnaire, the Health Literacy Scale-Short Form (HLS-SF), Cancer Behavior Inventory-Brief Version (CBI-B), and the Social Support Questionnaire (SSQ).

The Health Literacy Scale-Short Form: To measure health literacy, the HLS-SF that has been validated in 6 Asian countries has been used. This questionnaire was designed by Van Duong et al. in 2017 and is based on the European version of the Health Literacy Questionnaire. This questionnaire has 12 questions in the 3 subscales of health care, disease prevention, and health promotion. The items of this questionnaire are scored on a 4-point Likert scale ranging from 1 (very difficult) to 4 (very easy).

Cronbach's alpha and the fit index values for this questionnaire in a Vietnamese study were 0.87 and 0.97, respectively. The reliability of this questionnaire in the population of rural Vietnam indicates an acceptable coefficient of 0.79. The coefficient of half of the test for this questionnaire was also reported as an acceptable coefficient of 0.86.

The results of the analysis showed that there is a relationship between the health literacy score obtained from this questionnaire and education and gender. The validity of this tool has been reported by Van Duong et al. (2017) using construct validity method and convergent validity. The results of this tool have shown a positive and significant relationship with the level of higher education, and financial ability.²¹ The reliability of this questionnaire was assessed through internal consistency method (Cronbach's alpha) in the present study and was an acceptable coefficient of 0.86.

The Cancer Behavior Inventory-Brief Version: The CBI-B is a 12-item questionnaire used to measure cancer management self-efficacy. This form of the questionnaire consists of the 4 subscales of independence, participation, stress management, and emotion management. The items are scored on a 9-point Likert scale. The assessment of the validity of this questionnaire using correlation method has shown its positive relationship with QOL and optimism and its negative relationship with depression and stress caused by the disease ($P < 0.01$). The evaluation of the reliability of this questionnaire through internal consistency method (Cronbach's alpha) has presented an acceptable coefficient of 0.88. The determination of the reliability of this questionnaire through internal consistency method (Cronbach's alpha) in the present study presented an acceptable coefficient of 0.85.²²

Therapeutic Outcomes of Social Support: Social support was measured using a therapeutic factors inventory-short form. This

questionnaire consists of 8 items scored on a 5-point Likert scale and its validity and psychometric properties have been evaluated in 3241 women with breast cancer. The results of factor analysis reported by Fernandez-Gonzalez and Bravo-Valenzuela (2019) showed the structural difference between the two factors of instrumental support and emotional support in this questionnaire.

The results of factor analysis showed that the two subscales are separate. The results of construct validity showed a relationship between social support and marital status, having children, social isolation, and body mass index. Moreover, the correlation between the 8-item version and 19-item version of the questionnaire was positive and significant ($P < 0.01$). The results of this questionnaire showed a correlation with other health measures performed by breast cancer patients. The determination of the reliability of this questionnaire using internal consistency method (Cronbach's alpha) in the present study presented an acceptable coefficient of 0.88.²³

Information was collected using a questionnaire. Patients with breast cancer were selected through available sampling method. In a suitable place in the clinical environment, the objectives of the research, how to comply with ethical standards, and completing questionnaires were explained to them by the researcher. Patients entered the study voluntarily and with knowledge of the research objectives, and then, completed the questionnaires individually in the same place and alone away from family and others (in a safe and quiet environment).

The study inclusion criteria included being a resident of Lorestan province, Iran, and having breast cancer. The exclusion criteria included having other types of cancer, living in other provinces, and inaccuracy in answering questionnaire questions or unwillingness to continue cooperation. Subjects completed the HLS-SF, CBI-B, social support questionnaires, and the demographic characteristics form.

After careful monitoring of the completion of the questionnaires (Researcher's followed up the data and distributed the questionnaire) and data collection, distorted cases and statistical omissions were excluded from the data after the initial evaluation, and to compensate for the loss of the subjects, 7 more people participated in the study. The reason for the drop out of the subjects was the lack of thorough completion of the questionnaires. Therefore, the sampling was continued to reach 300 subjects. Thus, 300 questionnaires were analyzed in terms of accuracy and completeness. To analyze the data and investigate the causal relationships between them, structural equation modeling was used in Amos statistical software (IBM Corp., Armonk, NY, USA). This study was taken from the doctoral thesis number 162264570 in health psychology at the Islamic Azad University of Gorgan in the research assistant system.

Results

The demographic information indicates that 4 people in the study sample were under 35 years of age, 69 people were in the 35-44 years age group, 52 people were in the 45-50 years age group, 74 people in the 51-55 years age group, 53 people in the 56-65 years age group, and 48 people were above 65 years of age. Of the studied samples, 8, 51, 74, 126, and 41 were reported to have primary education, middle school education, high school education, a Bachelor of Science (BSc) degree, and a Master of Science (MSc) degree or higher education, respectively. The time of diagnosis of breast cancer until the time of the study was reported to be less than 1 year, 1-2 years, 2-5 years, and more than 5 years, respectively, in 73, 75, 91, and 61 subjects (Table 1).

The reported rate for the skewness and skewness indices of the scores of the distribution of the scores of the variables indicates that the data is in the normal range and there is no serious violation of the normal assumption of the data (Table 2).

Table 1. Demographic information of patients in this study

Variables	Subgroups	n (%)
Age groups (year)	Less than 35	4 (1.30)
	35 to 44	69 (23.00)
	45 to 50	52 (17.30)
	51 to 55	74 (24.70)
	56 to 65	53 (17.70)
Education levels	More than 65	48 (16.00)
	Elementary school	8 (2.70)
	Middle school	51 (17.00)
	High school	74 (24.70)
	BSc	126 (42.00)
Diagnosis times (year)	MSc or higher	41 (13.70)
	< 1	73 (3.24)
	1-2	75 (0.25)
	2-5	91 (3.30)
	> 5	61 (3.20)

BSc: Bachelor of science; MSc: Master of science

The reported correlation for the relationship between variables indicates a direct and significant relationship between health literacy and social support and cancer self-efficacy, and a direct and significant relationship between social support and cancer self-efficacy ($P < 0.01$) (Table 3).

Table 2. Statistical description of health literacy through social support on cancer self-efficacy

Variables	Mean \pm SD
Health care	11.29 \pm 3.50
Preventing a disease	11.07 \pm 3.62
Health promotion	11.19 \pm 3.49
Health literacy	33.55 \pm 10.29
Social Support	24.12 \pm 5.99
Efficacy	68.23 \pm 17.40

SD: Standard deviation

It can be concluded that the structural model of health literacy through social support on cancer self-efficacy in cancer patients has a good fit and the research hypothesis is

confirmed (Figure 1).

Chi-square fit statistics (CMIN) was 2.94 and the root mean square error of approximation (RMSEA) was 0.081, which considering the acceptable value of each of the indicators confirms the good fit of the model. Moreover, the normed fit index (NFI) with a value of 0.99, and the comparative fit index (CFI) with a value of 0.99 indicated a very good fit of the model. Finally, from the absolute fit indices, the goodness-of-fit index (GFI) with a value of 0.98 and the adjusted goodness of fit index (AGFI) with a value of 0.94 indicated a very good fit of the model with the experimental data (Table 4).

Based on the obtained experimental data, the size of the direct effect of health literacy on cancer self-efficacy is 0.25 ($p < 0.01$). This direct coefficient means that an increase in the health literacy score was associated with an increase of 0.25 per score of cancer self-efficacy. Furthermore, the indirect effect of health literacy on cancer self-efficacy was 0.33 and statistically significant ($P < 0.05$) (Table 5).

Discussion

The aim of this study was to investigate the structural pattern of health literacy on self-efficacy in coping with cancer through social support in cancer patients. In the context of caring for cancer patients, increasing survival rates, selecting treatment options in the health system and reviewing various treatments, and managing short-term, medium-term, and long-term side effects make health literacy a very important factor in caring for cancer patients.

Table 3. Correlation matrix of variables of health literacy through social support on cancer self-efficacy

Variables	1	2	3	4	5	6
1. Health care	1	-	-	-	-	-
2. Disease prevention	0.93**	1	-	-	-	-
3. Health promotion	0.89**	0.89**	1	-	-	-
4. Health literacy (total)	0.97**	0.97**	0.95**	1	-	-
5. Social support	0.60**	0.65**	0.60**	0.64**	1	-
6. Self-efficacy	0.55**	0.56**	0.55**	0.57**	0.67**	1

* $P < 0.05$, ** $P < 0.01$

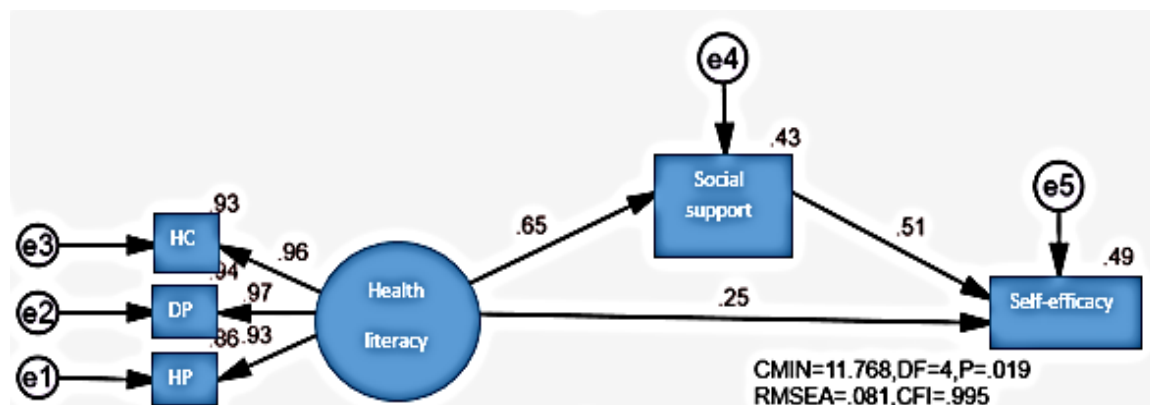


Figure 1. Structural model of health literacy through social support on cancer self-efficacy

Promoting health literacy in cancer patients is an essential strategy for providing quality and patient-centered care. Common elements of successful interventions in promoting health literacy of cancer patients include combining face-to-face interactions with health professionals and the use of multimedia technologies, emphasizing the identification of vulnerable individuals and groups with health literacy deficiencies, and considering education, behaviors, and factors that influence health decisions.²³

Cancer patients need knowledge and skills to identify signs and symptoms, follow the dietary guidelines recommended by physicians, and identify activities that increase the risk of spreading the disease. Patients with low levels of health literacy benefit from practical interventions such as cognitive and behavioral interventions. Communicating with the patient, teaching them numerical skills, evaluating them in the clinical context, and teaching the consequences of measuring biological indicators (such as blood pressure and

describing the side effects of drug abuse in a simple language) leads to the improvement of patients' health literacy.⁴ Findings showed that health literacy has a direct effect on cancer self-efficacy. Health literacy also has an indirect effect on treatment compliance through social support.

These results are in line with the findings of the research by Lee and Oh in 2020 on the direct relationship between health literacy and health status.¹⁶ Badpar et al. in 2017 also showed that social support and health literacy are directly related to self-care.¹⁷ Gardiner in 2019 showed that health literacy has a direct effect on therapeutic behaviors in chronic kidney patients.¹⁸ Johnson et al. in 2010 also showed that social support strengthens the relationship between health literacy and physician follow-up.¹⁹ Xu et al. in 2020 showed that continuation and adherence to medication along with supporting patients with breast cancer was one of the most important things in advancing the treatment of patients.²⁰ The results of this research are in line with our results.

Table 4. Comparative fit index of health literacy through social support on cancer self-efficacy

Variables	Modified fit		Adaptive fit		Absolute fit	
	CMIN/df	RMSEA	NFI	CFI	GFI	AGFI
Acceptable amount	5 <	10 >	0.90 <	0.90 <	0.90 <	0.80 <
The value obtained	2.94	0.81	0.99	0.99	0.98	0.94

CMIN/df: Chi-square fit statistics/degree of freedom; RMSEA: Root mean square error of approximation; NFI: Normed fit index; CFI: Comparative fit index; GFI: Goodness-of-fit index; AGFI: Adjusted goodness of fit index

Table 5. Direct and Indirect Relationships of health literacy through social support on cancer self-efficacy

Relationships	Effect size	About bootstrap		Significance level
		Low limit	High limit	
Total Effect	0.58	0.52	0.64	0.06
Direct Impact	0.25	0.17	0.34	0.07
Indirect Effect	0.33	0.27	0.38	0.12

Self-efficacy is the patient's confidence in his/her ability to successfully perform the action that leads to the desired result.²⁵ What successful cancer survivors have in common is self-management, health self-efficacy, or their confidence in their ability to manage and treat post-cancer health care. Health self-efficacy is associated with emotional well-being, coping, adherence to a healthy lifestyle, monitoring, and health behaviors in cancer survivors.¹¹

Social support is a direct facilitator of self-efficacy. Social support provides a sense of psychological well-being, positive perception, and growth in cancer patients. Social support and hope act as mediators between cancer self-efficacy and adherence to the treatment in breast cancer patients. Self-efficacy is directly related to adherence to the treatment regimen or exercise programs prescribed by the treatment staff. Patients who report higher levels of self-efficacy have more social support available and are satisfied with that support. In line with the theory of self-efficacy and supporting evaluation based on self-efficacy, various health care models have emerged. In these models, the patient is not considered as a passive recipient of care, but as an active factor in the treatment decision-making process in terms of treatment challenges. Challenges faced by cancer patients include coping with severe symptoms of pain, fatigue, and being able to function independently in order to manage life.²² The most important limitation of the present study is related to the dimension of place and time of the study, which limits the generalization of the research results to other groups or other communities. The design of the present study was also a predictive

correlation that did not determine causation. The data of this study are of self-report type that may increase the general variance and make the correct relationships between the variables appear larger. Misunderstanding of the questions and insufficient attention to the results may also affect the results. As a research proposal, it is recommended to implement the present research project longitudinally or experimentally to determine the causal relationships. This study should be repeated in groups with other diseases and different characteristics. The mediating role of cancer self-efficacy and health literacy in the model of structural equation modeling should also be investigated.

Conclusion

According to the information reported from the analysis of hypotheses, it can be concluded that the exogenous variable and the mediator of the proposed model are significant predictors of the cancer self-efficacy among the patients with breast cancer. Cancer self-efficacy is one of the known variables in the field of clinical interventions. Health literacy is recognized as a valuable variable that can be promoted through education and communication, and is also an individual risk factor for disease and poor health. People who have better access to information sources and are better able to understand them are more likely to internalize this information. This can lead to better health outcomes and better use of health care.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

This study was taken from the doctoral thesis in health psychology at the Islamic Azad University of Gorgan in the research assistant system.

Financials support and sponsorship

No financial assistance was received from individuals, institutions, or organizations for the preparation and writing of this article.

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