



Effect of Perceived Social Support, Spiritual Well-being, Health Literacy, and Resilience on Quality of Life in Patients Undergoing Hemodialysis: A Structural Equation Model

Fatemeh Hassani¹, Kourosh Zarea^{1,2}, Maryam Gholamzadeh Jofreh^{1,*}, Zahra Dashtebzorgi³ and Sally Wai-Chi Chan⁴

¹Department of Counseling, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

²Nursing Care Research Center in Chronic Diseases, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

³Department of Psychology, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

⁴Tung Wah College, Hong Kong, China

*Corresponding author: Department of Counseling, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran. Email: gholamzadeh.m723@gmail.com

Received 2022 February 02; Revised 2022 February 06; Accepted 2022 February 08.

Abstract

Background: Spiritual well-being, social support, health literacy, and resilience may affect the quality of life (QOL) in patients undergoing hemodialysis.

Objectives: The purpose of this study was to investigate the effect of perceived social support, spiritual well-being, health literacy, and resilience on the QOL in patients under hemodialysis.

Methods: This descriptive cross-sectional study randomly included 260 patients from three educational hospitals in Ahvaz, Iran. Data were collected using a 36-item QOL questionnaire, Spiritual Health Questionnaire (SHQ), Perceived Social Support (PSS) Questionnaire, Resilience Questionnaire, and Montazeri et al.'s Health Literacy for Iranian Adults (HELIA) Questionnaire. Stata software version 14 was used for data analysis. The results were evaluated using descriptive statistics and a structural equation model (SEM).

Results: In this study, a total of 260 patients (male: 138 vs. female: 122; mean age: 51.73 ± 15.32 years) undergoing hemodialysis were included. Most of the patients were married (76.9%) and had at least one comorbid disease (59.2%). Findings showed that health literacy, spiritual well-being, and social support had a significant correlation with the QOL ($P < 0.001$). However, resilience was not significantly related to the patients' QOL ($P > 0.58$).

Conclusions: To improve the QOL of patients undergoing hemodialysis, health care providers need to improve patients' health literacy, social relationships, and spiritual well-being.

Keywords: Hemodialysis, Quality of Life, Health Literacy, Social Support, Spiritual Well-being, Resilience

1. Background

Chronic kidney disease (CKD) is one of the most serious threats to human health worldwide (1, 2). In this context, hemodialysis is regarded as the most common approach to CKD treatment (3). In other words, CKD has currently affected 2 - 3% of the world's population, and about 89% of patients are now receiving hemodialysis treatment (4). Approximately 2.6 million people worldwide will continue to live on dialysis and kidney transplants, and this number is expected to reach 5.5 million people in the world by 2030 (5). The average prevalence of end-stage renal disease (ESRD) in Iran is higher than the global average (6). There were 24,000 hemodialysis patients in Iran in 2015, a figure that rose to 29,500 in 2016 and thus increased by 23% approximately (7). Although dialysis can increase

life expectancy, it cannot completely replace kidney function. As a result, patients experience numerous psychological complications and health problems (8). ESRD is a serious challenge in many developing countries, affecting patients' quality of life (QOL), social and financial conditions, and mental health (9). Hemodialysis patients suffer from problems such as decreased quality of communication with family and friends due to chronic disease conditions, which demonstrates the need for more social support in these patients (10). Some studies have shown that adaptation with chronic diseases occurs faster in people who have facilitators such as hope and social support (11).

Spirituality is one of the four dimensions of human health, along with physical, mental, and social dimensions. Beliefs, practices, and religious and spiritual experi-

ences can have an impact on health conditions (12). Spirituality is considered a significant source of coping with chronic diseases. Research evidence supported that spiritual support increased the patients' ability to adapt to the onset of disease and accelerated recovery (13).

To manage physical and mental health, health literacy is essential (14). Health literacy can empower people to apply health information to make judgments and take decisions in everyday life concerning healthcare, disease prevention, and health promotion, thus maintaining or improving their QOL (15, 16). In patients with CKD, health literacy and empowerment are critical because the patients must undergo hemodialysis two or three days a week to manage the disease and maintain electrolyte and fluid balance. These patients need to observe dietary restrictions such as fluid intake, sodium, phosphorus, and potassium, as well as the use of various drugs to treat and prevent CKD-related complications (17, 18). Research has shown that limited health literacy is associated with decreased renal function and increased hospitalization and mortality in patients with renal problems (19). Thus, higher level of literacy could be associated with better abilities to manage hemodialysis and would lead to better perceived QOL (20). Resilience is regarded as a source of resistance against stress, as well as the skill of being able to gain a positive perspective, adapt, and cope with life problems and events. People with high levels of psychological resilience could understand their stress and maintain their physical and mental health using effective strategies as an adaptation process (21). Patients with CKD who undergo hemodialysis may suffer from various forms of stress. Since resilience increases the ability to cope with traumatic situations, it is hypothesized that higher resilience would be associated with better QOL in CKD patients undergoing hemodialysis (22).

2. Objectives

This study aims to investigate the causal model of direct and indirect effects of perceived social support, spiritual well-being, health literacy, and resilience on the QOL in hemodialysis patients.

3. Methods

3.1. Design

This study adopted a cross-sectional design based on structural equation model (SEM) to evaluate the effects of perceived social support, spiritual well-being, and health literacy on QOL in hemodialysis patients considering resilience as a mediating factor.

3.2. Sample

Patients were randomly selected from three educational hospitals in Ahvaz, Iran. A total of 260 patients were used as the sample size. In this context, we considered 5% alpha, 80% standard deviation, and 30% error (23). The sample size formula can be written as:

$$n = \frac{z_{1-\frac{\alpha}{2}}^2 s^2}{d^2}$$

First, our sampling framework was prepared, which involved 245 patients referring to Imam Khomeini Hospital, 80 patients referring to Razi Hospital, and 86 patients referring to Golestan Hospital. Based on the mentioned framework, 205, 34, and 33 patients were randomly selected from Imam Khomeini, Razi, and Golestan hospitals, respectively. However, 12 patients refused to participate in the study, and finally, 260 patients agreed to complete the research questionnaires. The inclusion criteria were the history of undergoing hemodialysis for at least six months, being literate, and having communication skills. The exclusion criteria included lack of literacy and suffering from severe mental disorders.

3.3. Instruments

Data Collection Instruments Consisted of Five Questionnaires

3.3.1. SF-36 Quality of Life Questionnaire

This questionnaire has 36 items that measure various aspects of health-related QOL. These aspects include physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH). Questions are scored based on a 5-point Likert scale (ranging from high = 1 to not at all = 5), and high scores indicate higher QOL. The possible score range is from 26 to 130. The validity and reliability of the Persian version of this questionnaire has been confirmed in different dimensions, from 0.77 to 0.929 (24). This questionnaire has been frequently used in various foreign and domestic studies, and its validity and reliability have been confirmed.

3.3.2. Spiritual Well-being Scale (Paloutzian & Ellison, 1982)

This test consists of 20 questions and two subscales. The odd questions are related to the subscale of religious well-being and measure an individual's perception or experience of satisfaction in relation to God. The even questions are related to the subscale of existential well-being and measure purposefulness and satisfaction with life. The scores are based on a 6-point Likert scale (ranging from strongly agree = 1 to strongly disagree = 6). Finally, the spiritual well-being score of the individual is divided into three

categories: low (20 - 40), moderate (41 - 99), and high (100 - 120). Cronbach's alpha coefficient is 0.90, 0.82, and 0.87 for spiritual well-being scale, religious status subscale, and existential well-being subscale, respectively. The scale validity is calculated through factor analysis and correlation with the scores of happiness, religiosity, and mental disorder, which were reported as acceptable (25).

3.3.3. Multidimensional Scale of Perceived Social Support

This is a multidimensional 12-item instrument developed by Zimet et al. (26) to assess perceived social support from three sources: family (questions 3, 4, 8, 11), friends (questions 6,7,9,12), and important people in life (questions 1, 2,5, 10). The possible score range is from 4 to 20. This questionnaire has been frequently used in Iran, and Cronbach's alpha coefficient of social support subscales has been reported to be between 0.76 and 0.89 (27).

3.3.4. Resilience Questionnaire

This instrument consists of 25 items in five subscales involving the concept of individual competence; trust in individual instincts; negative affective tolerance; the positive acceptance of change and safe relationship, control, and spiritual influences (28). This questionnaire is scored based on a 6-point Likert scale ranging from 0 (completely incorrect) to 5 (always correct). Connor and Davidson stated that the Cronbach's alpha coefficient and validity of the resilience scale were 0.89 and 0.93, respectively (22).

3.3.5. Health Literacy for Iranian Adults

This questionnaire was introduced by Montazeri et al. and involves 33 items that measure five dimensions of accessibility, reading comprehension, evaluation, decision making, and behavior. Each question is scored based on a 5-point Likert scale. Scores 31-62, 63-124, and 125-155 indicate poor, moderate, and optimal health literacy, respectively (24). This instrument was selected because it addresses all aspects of health literacy, measures each dimension separately, and is easy to use and fast to complete compared to other instruments such as the test of functional health literacy in adults (TOFHLA). This instrument has also been used in various studies, which indicates its acceptable validity (29).

3.4. Ethical Considerations

The research was approved by the Ethical Committee of AJUMS (IR.AJUMS.REC.1399.853). The research objectives were explained to participating patients and they were ensured that their information would be kept confidential and all personal information would be protected. Besides, an informed written consent was obtained from all participants.

3.5. Data Analysis

Data analysis was carried out using descriptive statistics. To evaluate the effect of spiritual well-being, perceived social support, health literacy, and resilience on QOL, SEM was used (Figure 1). Stata software version 14 was used for data analysis.

4. Results

The socio-demographic and clinical characteristics of the participants are presented in Table 1. Out of 260 patients, 138 were male, and 122 were female, and the mean age was 51.73 ± 15.32 years. Most of the patients were married (76.9%), and some had no children (19.6%). Moreover, 36.2% of the patients had a middle school education, 55% were at a low-income level, and 59.2% had at least one comorbid disease. Of the female participants, 36.2% were housewives. Besides, the mean duration of hemodialysis use was 5.06 ± 3.43 years (Table 1).

4.1. SEM

The results showed a direct and significant relationship between all variables ($P < 0.05$), except between resilience and QOL ($P > 0.58$). There was a direct and significant relationship between resilience and health literacy, spiritual wellbeing, and social support ($P < 0.001$). Results of investigating the relationship between the eight dimensions of QOL and the total score, which shows the effect of each dimension on the total score of QOL, showed a significant relationship between all dimensions of QOL, including PF, RP, BP, GH, VT, SF, RE, and MH ($P < 0.001$), except for the fatigue/energy dimension ($P > 0.51$). All four dimensions of health literacy, including reading skills, comprehension, appraisal, and access, were significantly related to each other ($P < 0.001$). The results also showed a significant correlation between the two dimensions of spiritual wellbeing, ie, religious and existential dimensions ($P < 0.001$). There was also a significant relationship between dimensions of social support, including the relationship between family, friends, and other important people with the total score of the MSPSS ($P < 0.001$) (Table 2 and Figure 2).

The SEM indexes are presented in Table 3.

5. Discussion

This study was the first of its kind among Iranian society to examine the relationship between QOL of patients undergoing hemodialysis with social support, health literacy, and spiritual well-being considering resilience as a mediating factor. The findings of the present study showed

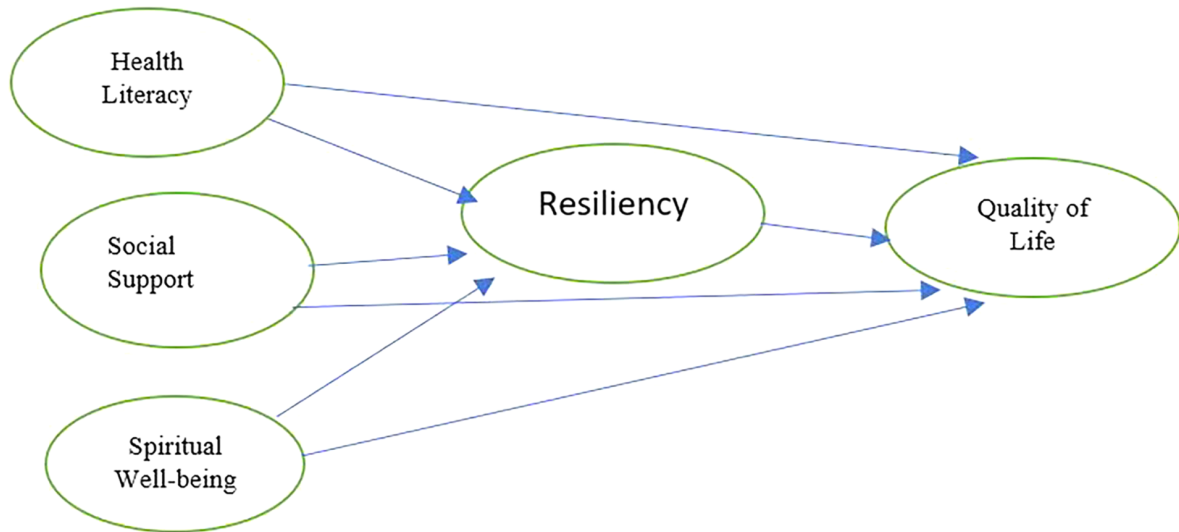


Figure 1. Proposed effect of spiritual well-being, perceived social support, health literacy, and resilience variables on QOL in hemodialysis patients

that the QOL of these patients was positively affected by their health literacy, social support, and spiritual well-being, but QoL was not significantly related to resilience. Also, there was a strong significant relationship between all dimensions of health literacy including reading skills, comprehension, appraisal, and accessibility to QOL in patients undergoing hemodialysis.

It was also revealed that the QOL of patients under hemodialysis is affected by their health literacy. This finding is in line with the results of studies by Ebrahimi et al. in Iran and Dodson et al. in Australia (30, 31). Health literacy is defined as cognitive and social skills that determine the motivation and ability of individuals to gain understanding and use the information to promote and maintain health. It consists of two dimensions: individual and social. The individual dimension includes information, capacities, and existential potential of the individual and the social dimension includes culture, ethnicity, family, and a social and economic status that can affect people's health behaviors (32). Health literacy is considered a necessary factor to manage physical and mental health status (33). Health literacy and patient empowerment are considered as critical measures for CKD patients because they must undergo hemodialysis two or three days a week to manage the disease and maintain electrolyte and fluid balance. These patients also need to comply with dietary restrictions such as fluid intake, sodium, phosphorus, potassium, as well as the use of various drugs to treat and prevent CKD-related complications (34).

However, our findings do not agree with the findings of

Shayan et al. in Turkey and Green et al. in the United States, that reported no relationship between health literacy and QOL in hemodialysis patients (34, 35). This difference may be due to the different cultural and social contexts of the countries studied.

In this work, a strong relationship was also found between QOL and all the dimensions of perceived social support including family, friends, and important others in these patients. This implicates that better and broader social relationships increase the QOL in patients undergoing hemodialysis, which is in line with the study by Pan et al. (11), Alshraifeen et al. (36), and Rambod and Rafii (23). Pan et al. (11) showed that social support plays a strong mediating role in reducing depressive symptoms and sleep disorders and increasing QOL in hemodialysis patients. Social support is one of the most effective methods to facilitate long-term treatment and disease adaptation, which is usually carried out by family, friends, colleagues, spiritual counselors, mental health professionals, and community members (37). Social support is a valuable coping technique and source of effective adjustment that paves the way for love, affection, self-assertion, self-awareness, and a sense of belonging. Even if it cannot overcome stressful situations in some circumstances, it enables people to be more optimistic by reducing their anxiety and increasing their self-esteem. It might also help people cope with challenging situations and create new solutions, hence making them more satisfied with life (10, 38).

Our results also revealed a significant relationship between patients' spiritual well-being (in both religious and

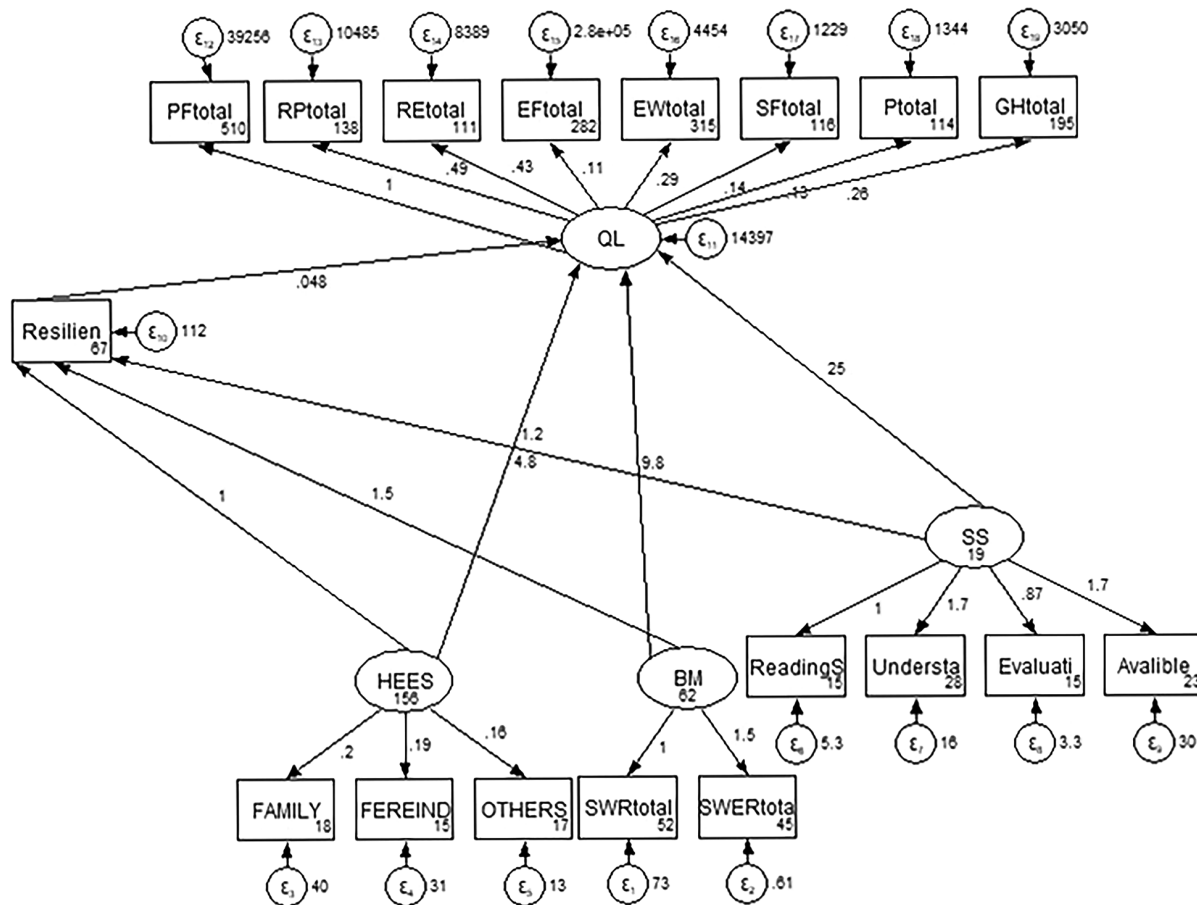


Figure 2. Effect of dimensions of spiritual well-being, dimensions of perceived social support, dimensions of health literacy, and resilience variables on dimensions of QOL in hemodialysis patients

existence dimensions) and their QOL. In other words, the patients' QOL increased with the improvement of spiritual health and well-being. This finding is consistent with the findings of a systematic review by Burlacu et al. in Romania (39). In fact, strong religious beliefs among the hemodialysis patients correlated with decreased perceptions of illness burden and increased perceptions of social support. In this regard, some studies suggested that religious feelings should be part of QOL measures and could be associated with improved survival in this patient population (40). Religion and spirituality are the means to have a relationship with God, to search for meaning and purpose in life, to seek healing through non-physical means (prayer, meditation, religious belief, etc.) and to seek inner peace and well-being so as to cope with diseases (41). Numerous studies showed that spirituality and religiosity reduced depression and facilitated rapid recovery from depression in patients with chronic medical conditions. Research also

showed that spirituality increased the patient's ability to adapt to an outbreak of disease and accelerated recovery (42).

Hemodialysis patients often worry about the unpredictable future of their disease. They often lose their jobs and face financial problems. They are always depressed and afraid of death due to chronic disease. On the other hand, severe and chronic diseases might leave the person with questions about the meaning and purpose of life, hence giving more weight to spiritual well-being as a factor that promotes QOL (43). On the other hand, Vitorino et al. found that religious beliefs can act as the two sides of the same coin and have both positive and negative effects depending on the patient's attitudes (44).

Our results showed no relationship between resilience and QOL of these patients, which was not in line with the results of studies by Abdollahi et al. (45) and Moreira et al. (46). Besides, Zhang et al. found a significant relationship

Table 1. Socio-demographic and Clinical Characteristics of the Participants (N = 260)

Variables	Mean \pm SD or No. (%)	Min	Max
Age (y)	51.73 \pm 15.32	17.00	93.00
Sex			
Men	138 (53.1)		
Women	122 (46.9)		
Marriage status			
Single	46 (17.7)		
Married	200 (76.9)		
Divorced	4 (1.5)		
Widowed	10 (3.8)		
Having children	3.13 \pm 2.37 person	0.00	11.00
Education			
Illiteracy	43 (16.5)		
Primary education	94 (36.2)		
Diploma	55 (21.2)		
Associate degree	36 (13.8)		
Bachelor	28 (10.8)		
Master of sciences	4 (1.5)		
Job			
Employee	26 (10)		
Manual worker	6 (2.3)		
Self-employed	41 (15.8)		
Housewife	94 (36.2)		
Retired	50 (19.2)		
Pensioner	14 (5.4)		
Student	2 (0.8)		
Jobless	27 (10.4)		
Income			
Weak	143 (55)		
Moderate	101 (38.8)		
Good	14 (5.4)		
Excellent	2 (0.8)		
Duration (y)	5.06 \pm 3.43	1	18
Co-morbid disease			
Yes	154 (59.2)		
No	106 (40.8)		

between resilience and QOL in breast cancer patients. Social support acted as a mediator between resilience and the QOL of these patients (47). Due to the fact that this study was conducted during the COVID-19 pandemic, the difference between the present study and other studies could be

related to the time and place differences.

Mental and psychological status of participants in completing the questions, especially during the COVID-19 pandemic, is perhaps a factor that limits the generalizability of our results.

5.1. Conclusions

This study showed that improvement in health literacy, spiritual well-being, and perceived social support of patients undergoing hemodialysis can increase their QOL. The results showed that health literacy as a cognitive and social skill is necessary for the patients' QOL improvement as the patients need to be aware of and adhered to dietary restrictions and various drugs prescribed during treatment. Hemodialysis patients need to improve their skills in reading useful health-related content, comprehending it, evaluating it, and ultimately acting on it to improve their QOL. On the other hand, the social support provided by families and relatives to hemodialysis patients plays an effective role in improving the QOL of these patients. Moreover, spirituality, religion, and relationship with God were effective factors in maintaining and improving the QOL of these patients.

Footnotes

Authors' Contribution: FH, data gathering, preparing the draft of the paper, MGh, supervision, critical appraisal KZ, supervision, prepare the draft. ZD, supervision Sch, supervision.

Conflict of Interests: The authors declared no conflict of interest.

Data Reproducibility: Data is available on request from the authors. The data that support the findings of this study are available on request from the corresponding author, [M.Gh.] upon reasonable request.

Ethical Approval: The research was approved by the Ethical Committee of Ahvaz Jundishapur University of Medical Sciences (Code: IR.AJUMS.REC.1399.853, Link: ethics.research.ac.ir/EthicsProposalView.php?id=177510).

Funding/Support: There is no funding/support.

Informed Consent: We obtained an informed consent from patients before gathering data. Informed consent of the present study was uploaded in Behsan.ajums.ac.ir

Table 2. Correlation Between Quality of Life, Resilience, Spiritual Wellbeing, and Health Literacy

	Standardized Coef.	Std. Err.	z	[95% Conf. Interval]	P-Value
Quality of life					
Resilience	0.088	0.1659573	0.53	-0.2374334, 0.4131072	0.597
Health literacy	0.480	0.0631483	7.60	0.3558872, 0.6034238	< 0.001*
Spiritual health-being	0.1988369	0.099235	2.00	0.0043398, 0.393334	0.045*
Social support	0.4412484	0.184106	2.40	0.0804073, 0.8020894	0.017*
Resilience					
Health literacy	0.2087838	0.0574187	3.64	0.0962452, 0.3213224	< 0.001*
Spiritual health-being	0.3658709	0.0363301	10.07	0.2946651, 0.4370767	< 0.001*
Social support	0.4844362	0.1209738	4.00	0.2473319, 0.7215405	< 0.001*
Quality of life					
Physical function	0.6630278	0.0356999	18.57	0.5930574, 0.7329983	< 0.001*
Role limitation due to physical problem	0.6470095	0.0493938	13.10	0.5501995, 0.7438195	< 0.001*
Role limitation due to emotional problem	0.6171813	0.0489939	12.60	0.5211551, 0.7132075	< 0.001*
Energy/fatigue	0.0372758	0.057857	0.64	-0.0761218, 0.1506733	0.519
Emotional well-being	0.553029	0.0487283	11.35	0.4575233, 0.6485347	< 0.001*
Social functioning	0.5120299	0.0500158	10.24	0.4140007, 0.6100591	< 0.001*
Pain	0.5025833	0.0489843	10.26	0.4065759, 0.5985908	< 0.001*
General health	0.5893804	0.046347	12.72	0.4985419, 0.680219	< 0.001*
Health literacy					
Reading skill	0.9100231	0.0122658	74.19	0.8859826, 0.9340635	< 0.001*
Understanding	0.8506254	0.024302	35.00	0.8029943, 0.8982565	< 0.001*
Evaluating	0.8786599	0.0230207	38.17	0.8335401, 0.9237798	< 0.001*
Availability	0.7527047	0.0337557	22.30	0.6865447, 0.8188648	< 0.001*
Spiritual well-being					
SW of religion	0.6277272	0.0578961	10.84	0.514253, 0.7412014	< 0.001*
SW of existence	1	0.0952365	10.50	0.81334, 10.18666	< 0.001*
Social support					
Family support	0.5140841	0.0614022	8.37	0.393738, 0.6344301	< 0.001*
Friend support	0.4837387	0.0739511	6.54	0.3387973, 0.6286802	< 0.001*
Other support	0.4768695	0.0817641	5.83	0.3166148, 0.6371242	< 0.001*

Table 3. Fittingness Indexes of the Structural Equation Model

Indexes	RMSEA	CFI	TLI	χ^2 (129)	χ^2 (153)
	0.097	0.887	0.890	245.22	254.25

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