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Psychometric evaluation of the Persian version of the spiritual well-being scale (SWBS) in Iranian patients with cancer

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Abstract

Objective. The spiritual well-being scale (SWBS) is a widely used clinical scale which should be evaluated for Iranian patients with cancer. The aim of this study is to evaluate the psychometric properties of the Persian version of the SWBS in Iranian patients with cancer.

Method. This cross-sectional, methodological study was conducted among Iranian patients with cancer ($n = 400$). The participants were recruited using convenience sampling. The content, construct, convergent and discriminant validity, and reliability of the Persian version of the SWBS were evaluated.

Results. A two-factor structure for the scale was indicated with the factors being: *connecting with God* and *meaningless life* that explained 54.18% of the total variance of the concept of spiritual well-being. The results demonstrated the model had a good fit. Cronbach's alpha, McDonald's omega, and the inter-item correlation values of the factors indicated good internal consistency of the scale.

Significance of results. These results suggest that the Persian version of the SWBS is a reliable and valid measure to assess the spiritual well-being of patients with cancer through 16 items related to connecting with God and meaningless life.

Introduction

Cancer is the second most common cause of death worldwide, causing more than 8 million deaths each year. The incidence of cancer is expected to increase by more than 50% in the next decade (The ICGC/TCGA Pan-Cancer Analysis of Whole Genomes Consortium, 2020). One of the factors that impacts cancer patients' health is spirituality, which can be seen as a universal attribute that individuals seek to develop and maintain hope and meaning in their lives (Cheng et al., 2019). Spirituality is a dynamic and intrinsic dimension of human life that relates to the way individuals experience life, express themselves, and seek meaning, purpose, and transcendence (de Oliveira et al., 2019). Spiritual well-being is an important and positive tool for managing the often difficult changes in emotions, cognition, and behavior that come with a cancer diagnosis and living with the disease (Rademacher, 2006).

Spiritual well-being is considered a multidimensional concept. Spiritual well-being is defined as "the affirmation of life in a relationship with God, self, community, and environment that nurtures and celebrates wholeness" (Ellison, 1983). Some cultures believe that suffering from a chronic condition like cancer is a punishment from God (Tabrizi et al., 2016). Spiritual well-being is composed of two dimensions: existential, which is related to the meaning and purpose in life that is not dependent on one's religious thoughts, and religion, which deals with an individual's relationship with a greater power in the form of religious beliefs (Varner, 2009). A definitive diagnosis of cancer does not necessarily mean the end of life; however, it raises the question, "What is the meaning and purpose of life?" (Rademacher, 2006).

Spiritual well-being has been shown to positively impact an individual's hope, quality of life, life satisfaction, reduces one's mental stress (Boscaglia et al., 2005), and increases the survival chances of patients with cancer (Ahmad et al., 2011). Previous studies have also demonstrated that spiritual well-being is associated with lower levels of anxiety and depression (Martins et al., 2019), better psychological well-being (Cheng et al., 2019), and increased support and social interaction (Penman et al., 2009). Generally, in major health crises, such as chronic and life-threatening diseases (e.g., cancer, diabetes, cardiovascular disease), spirituality and religion

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can play an important role in promoting quality of life and are valuable factors for adapting to cancer (Wilson et al., 2017).

The concept of spiritual well-being is embedded in the culture and religious background of individuals. There is a need for an accurate tool to measure this concept among patients with cancer in the country of Iran, where Islam is the official religion. In Iran, there is increasing interest in the assessment of spiritual well-being as well as validation of a spiritual well-being scale among specific sub-populations, such as healthy people (Dadfar et al., 2019), older populations (Hallaj et al., 2014), psychiatric outpatients (Kazemzadeh Atoofi et al., 2020), and patients with acute myocardial infarction (Soleimani et al., 2017).

Several scales have been developed to evaluate spiritual well-being: the Functional Assessment of Chronic Illness Therapy — Spiritual Well-Being (FACIT-Sp) scale, with 12 items and 3 subdomains: peace, meaning, and faith (Bredle et al., 2011); Fisher's Spiritual Health and Life-Orientation Measure (SHALOM), with 20 items in 4 domains: personal, communal, environmental, and transcendental (Fisher, 2010); and the spiritual well-being scale (SWBS), comprised of 20 items with 2 subscales: existential well-being (EWB) and religious well-being (RWB) (Paloutzian and Ellison, 1982).

Given that the concept of spiritual well-being is a structure that is influenced by culture and beliefs, accurately measuring the concept requires a scale appropriate to the Iranian-Islamic context. In the present study, psychometric evaluation of the Persian version of the SWBS was performed because it is a widely used and appropriate tool for patients with cancer and has been used in the Iranian population for other chronic diseases. The aim of this study was to evaluate the psychometric properties of the Persian version of the SWBS among Iranian patients with cancer.

Methods

This cross-sectional, methodological study was conducted among patients with cancer admitted to hospitals affiliated with the Iran University of Medical Sciences from June to December 2019.

Study sample

According to Kellar and Kelvin (2012), the minimum sample size for conducting a factor analysis is equal to between 5 and 10 times more than the number of items of the intended instrument. As the Persian version of the SWBS contains 20 items, 400 patients with cancer were recruited into the study via convenience sampling. The first 200 participants in the sample were used to conduct the exploratory factor analysis (EFA) and the second 200 were used to evaluate the confirmatory factor analysis (CFA). The researcher explained study goals to the patients with cancer in the oncology wards of the university hospitals, and selected the patients who were willing to participate in the study and also met the inclusion criteria. The inclusion criteria for participants required that individuals be literate, an adult ($\geq$18 years of age), and free from any psychological disorders (and not using psychiatric drugs).

Instruments

In this study, the questionnaire consisted of two parts. First, demographic and cancer information was collected, including age, sex, marital status, educational level, employment, economic status, type of cancer, type of treatment, cancer stage, and years of being a patient with cancer. The second part included the Persian version of the SWBS (Abhari et al., 2018). The permission for the

use of this scale was obtained from Dr. Marzieh Nojomi. The Persian version of the SWBS consisting of two subscales: religious well-being (10 items) and existential well-being (10 items). The religious well-being subscale provides a self-assessment of one's relationship with God, while the existential well-being subscale offers a self-assessment of one's sense of life purpose and life satisfaction (Paloutzian and Ellison, 1982). The Persian version of the SWBS is scored on a 6-point Likert-type scale from 1 (completely disagree) to 6 (completely agree), with a reversed scoring method used for negative questions (items 1, 2, 5, 6, 9, 12, 13, 16, and 18). The range of scores for each of the subscales was between 10 and 60. Higher scores indicated higher religious or existential well-being.

Content validity

In this phase, content validity ratio (CVR) and content validity index (CVI) for the items were calculated by 10 faculty members in psychiatric nursing. The CVR examined the items' necessity (not necessary = 1, useful but not essential = 2, essential = 3). The formula for CVR is $(Ne - N/2)/(N/2)$, in which the Ne is the number of experts indicating "essential" and N is the total number of experts (Zamanzadeh et al., 2015). When the number of experts is 10, the minimum acceptable CVR is equal to 0.62 (Lawshe, 1975). To calculate CVI, ten experts (same as for CVR) evaluated the relevancy of items by dichotomous response: relevant = 4 and irrelevant = 1. The CVI was calculated by dividing the number of items experts rated as relevant (rating of 4) by the total number of experts (i.e., 10) (Zamanzadeh et al., 2015).

Construct validity

In this study, construct validity was measured using the EFA, CFA, and discriminant and convergent validity. Construct validity was evaluated through maximum-likelihood exploratory factor analysis (MLEFA) with Varimax rotation on the first set of 200 responses. The Kaiser–Meyer–Olkin test (KMO) and the Bartlett's test of sphericity were used to check the appropriateness of the study sample and the model. The number of factors was determined based on parallel analysis and exploratory graph analysis (EGA; Ledesma and Valero-Mora, 2007; Golino and Epskamp, 2017). Items with absolute loading values of 0.3 or greater were considered appropriate (Çokluk and Koçak, 2016).

The presence of an item in a latent factor is determined based on a factor loading of almost 0.3, which is estimated using the following formula: $CV = 5.152 \div \sqrt{(n-2)}$, where CV is the number of extractable factors and n is the sample size ($n = 200$). Next, items with communalities less than 0.2 were excluded from the EFA.

For the assessment of the structural factors, a CFA was conducted using the maximum-likelihood method and the most common goodness-of-fit indices among 200 samples. The model fitness was assessed according to root mean square of error of approximation (RMSEA), comparative fit index (CFI), parsimonious comparative fit index (PCFI), parsimonious normed fit index (PNFI), incremental fit index (IFI), and CMIN/DF. For the CFA, items with a standardized factor loading lower than 0.5 were removed from the model.

Convergent and discriminant validity

The convergent and discriminant validity of the Persian version of the SWBS were estimated using Fornell and Larcker's approach

Table 1. Socio-demographic and cancer information of participants ($n = 400$)

Variable	n (%)
Sex	
Male	232 (58)
Female	168 (42)
Marital status	
Single	52 (13)
Married	332 (83)
Divorced	6 (1)
Widow	10 (3)
Education level	
Under diploma	156 (39)
Diploma	108 (27)
Bachelor	92 (23)
Master or Doctorate	44 (11)
Employment	
Unemployed	96 (24)
Employed	204 (51)
Retired	100 (25)
Economic status	
Poor	60 (15)
Moderate	202 (50.5)
Good	138 (34.5)
Type of cancer	
Breast	76 (19)
Leukemia	72 (18)
Gastric	48 (12)
Cervix and Uterus	44 (11)
Colon	44 (11)
Lung	28 (7)
Brain	20 (5)
Osteosarcoma	16 (4)
Prostate	16 (4)
Pancreatic	12 (3)
Jaw	8 (2)
Esophageal	8 (2)
Hepatic	8 (2)
Type of treatment	
Chemotherapy	94 (23.5)
Radiotherapy	6 (1.5)
Surgery	12 (3)
Chemotherapy+ Radiotherapy	16 (4)
Chemotherapy + Surgery	218 (54.5)
Chemotherapy + Surgery + Radiotherapy	54 (13.5)
Cancer Stage	

(Continued)

Table 1. (Continued.)

Variable	n (%)
Stage 1	6 (1.5)
Stage 2	100 (25)
Stage 3	234 (58.5)
Stage 4	60 (15)

(Fornell and Larcker, 1981). Based on the results of the CFA, the two indices of average variance extracted (AVE) and maximum shared squared variance (MSV) were estimated to assess the convergent and discriminant validity of the extracted factors. According to recent studies, to establish convergent validity, (a) AVE should be greater than 0.5 or (b) composite reliability (CR) should be greater than AVE, (c) and all factor loadings should be significant, (d) and all standardized coefficients of the final model in CFA should be equal or greater than 0.5 (Malhotra and Dash, 2016; Pahlevan Sharif et al., 2018b; Pahlevan Sharif and Sharif Nia, 2020). To meet the discriminant validity criteria, the MSV of each construct should be less than its AVE (Henseler et al., 2015).

Reliability

Internal consistency was assessed using Cronbach's alpha (α), McDonald's omega (Ω), and average inter-item correlation (AIC). Coefficients Ω and α values greater than 0.7 were acceptable (Mayers, 2013). An AIC between 0.2 and 0.4 indicated good internal consistency (Mohammadbeigi et al., 2015). CR, which replaces Cronbach's alpha coefficient in structural equation modeling, was then evaluated, with a CR value greater than 0.7 considered acceptable (Sharif Nia et al., 2019).

Multivariate normality and outliers

Univariate distributions were examined for outliers, skewness, and kurtosis. Multivariate distributions were evaluated for normality and multivariate outliers. Multivariate normality can be evaluated through the use of the Mardia's coefficient of multivariate kurtosis. One indication of deviation from the normal distribution is a Mardia's coefficient greater than 8. Multivariate outliers were evaluated through the evaluation of a Mahalanobis distance. Items with a Mahalanobis distance of $p < 0.001$ were considered to be multivariate outliers (Esposito Vinzi et al., 2010). All of the statistical procedures were analyzed using SPSS-AMOS (V. 24), JASP (V. 13.1), SPSS R-menu (V. 2), and R software.

Ethical considerations

Informed consent was obtained from all individual participants included in the study. Patients were informed about the study aims and procedures. Moreover, they were assured that participation was voluntary and that it would not affect the course of their treatments and all their information will be confidential. The protocol of this study was approved by the Mazandaran University of Medical Sciences Research Ethics Committee (IR.MAZUMS.REC.1399.8740).

Results

The mean age of patients was 51.31 years old (SD = 15.9; range = 19–91) and most of them were married (83%). The mean number of years patients reported having cancer was 4.24 (SD = 3.7).

Table 2. Exploratory factors extracted from 17 items of the Persian version of the SWBS (n = 200)

No. of item	Mean	SD	Skewness	Kurtosis	Factor loading	h^2
Factor 1: Connection with GOD (%Variance = 32.02, Eigenvalue = 5.44)						
15. My relationship with God helps me not to feel lonely	5.13	1.05	−1.02	3.50	0.85	0.75
17. I feel most fulfilled when I'm in close communion with God	5.15	1.03	−1.13	4.28	0.82	0.82
20. I believe there is some real purpose for my life	5.09	1.06	−0.92	3.31	0.80	0.74
11. I believe that God is concerned about my problems	5.08	1.12	−1.20	4.37	0.79	0.69
19. My relationship with God contributes to my sense of well-being	5.10	1.14	−1.35	4.85	0.77	0.69
3. I believe that God loves me and cares about me	5.09	1.15	−1.18	4.16	0.77	0.65
7. I have a personally meaningful relationship with God	4.98	1.13	−1.15	4.31	0.65	0.43
4. I feel that life is a positive experience	4.79	1.27	−0.97	3.61	0.58	0.39
16. I feel that life is full of conflict and unhappiness	4.70	1.27	−0.80	3.50	0.47	0.26
Factor 2: Meaningless life (%Variance = 22.16, Eigenvalue = 3.76)						
12. I don't enjoy much about life	2.98	1.51	0.22	2.09	0.75	0.55
13. I don't have a personally satisfying relationship with God	2.66	1.55	0.56	2.30	0.68	0.50
18. Life doesn't have much meaning	2.86	1.52	0.33	2.16	0.67	0.56
9. I don't get much personal strength and support from my God	2.48	1.42	0.71	2.84	0.66	0.52
5. I believe that God is impersonal and not interested in my daily situations	2.41	1.37	0.72	2.99	0.65	0.51
6. I feel unsettled about my future	3.20	1.64	0.17	1.94	0.64	0.44
2. I don't know who I am, where I came from, or where I'm going	3.04	1.68	0.34	2.03	0.58	0.33
1. I don't find much satisfaction in private prayer with God	3.25	1.76	0.17	1.79	0.54	0.29
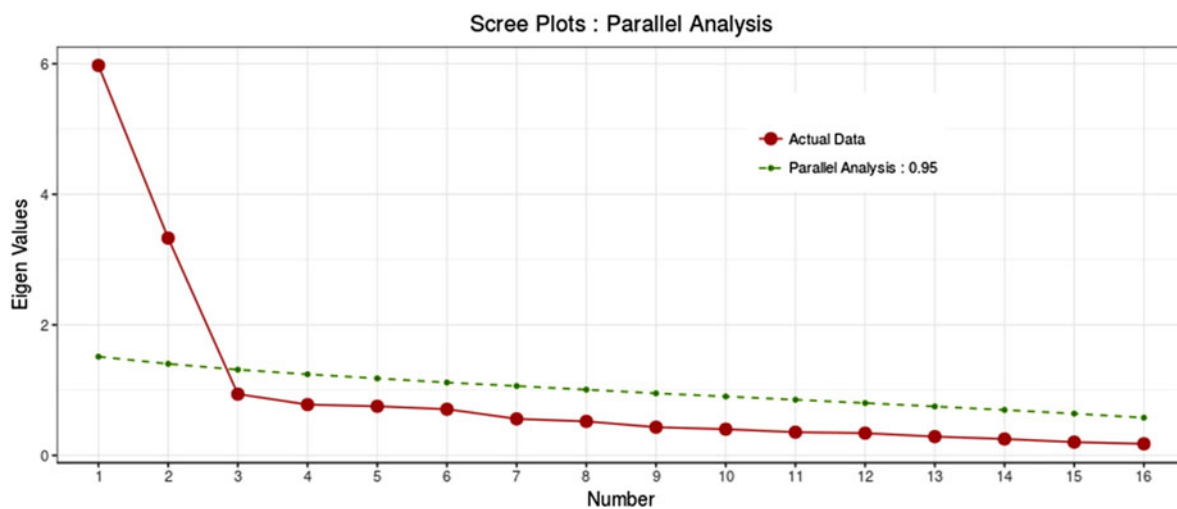
Fig. 1. Parallel analysis scree plot.

Other socio-demographic and cancer information about patients is provided in Table 1.

Regarding CVR and CVI, all items had an acceptable CVR between 0.8 and 1, and acceptable CVI (>0.7). Skewness, Kurtosis, and Mardia's coefficient confirmed that the data were normal (see Table 2).

In the MLEFA, the KMO test value was 0.89 and Bartlett's test value was 1874.30 ($p < 0.001$). The MLEFA revealed a two-factor structure for the Persian version of the SWBS (n = 17) with the two factors of *connecting with God* (9 items) and *meaningless life* (8 items) (see Figures 1 and 2). The eigenvalues of these two factors were 5.44 (extracted variance: 32.02%) and 3.77 (extracted variance: 22.17%), respectively. These two factors explained 54.19% of the total variance of the Persian version of the SWBS in Iranian patients with cancer (see Table 2 and Figure 3).

After modifying the CFA, all goodness-of-fit indices confirmed the model fit ($\chi^2 = 211.996$; n = 200; df = 100, $p < 0.001$; PCFI = 0.778; PNFI = 0.735; CMIN/DF = 2.120; RMSEA = 0.075

(CI 90%, [0.061, 0.081]); IFI = 0.934; CFI = 0.933; see Table 3 and Figure 4). Item 16 was removed from the model because it has a standardized factor loading lower than 0.5 (0.45); thus, the total number of scale items is 16.

The MSV smaller than AVE, and CR greater than AVE, indicating both factors have good divergent and convergent validity, respectively (see Table 4). The Cronbach's alpha, McDonald's omega, and the AIC values of the factors indicated excellent internal consistency (see Table 4).

Discussion

The results of the present study supported a two-factor structure: connecting with God and meaningless life, with 16 items from the Persian version of the SWBS. An EFA showed that these two factors explained 54.189% of the total variance of the Persian version of the SWBS in Iranian patients with cancer. The findings of Soleimani et al.'s study supported two factors (relation with

exploratory factor using CR, which was at a high level. An advantage of measuring CR rather than Cronbach's alpha is that CR is not affected by the number of scale items or obtained structure and is dependent, rather, on the actual factor loading of each item on the latent variable (Vinzi et al., 2010). To the best of our knowledge, the present study is the first to calculate the CR value of the SWBS.

In the current study, the first factor extracted was *connecting with God*, which addressed, for example, close communication with God and help and attention from God. In line with this, previous studies reported that a strong relationship with God can reduce stress and anxiety, and increase hope and a sense of purpose in life among patients with chronic illnesses (Cheng et al., 2019; Martins et al., 2019). In Iran, being Muslim is associated with increased faith in God. When Muslims are affected by chronic or intolerable diseases such as cancer, they often report that their religious beliefs and practices are a source of comfort in reducing physical and spiritual distress (Sajadi et al., 2018).
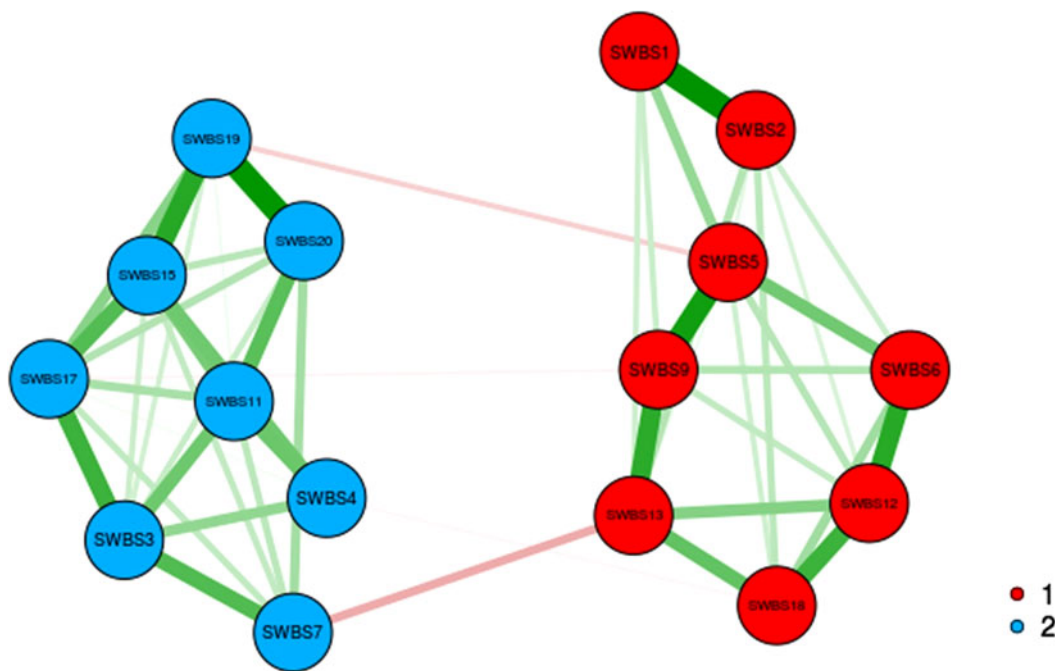

Fig. 2. Exploratory graph analysis.

God, relation with life) in patients with acute myocardial infarction, which explained 50.65% of the variance (Soleimani et al., 2017). Another study conducted with veterans who experienced chemical weapon exposure, extracted three factors (relationship with God, belief in fate and destiny, and life optimism), explaining 48.20% of the total variance (Sharif Nia et al., 2018). The difference in the number of factors extracted may be due to differences in participants' views and responses. It should be noted that just as spiritual beliefs vary from person to person, so will spiritual well-being be different in cultural subgroups (Pahlevan Sharif et al., 2018a).

The internal consistency of items of the Persian version of the SWBS was good, and the high Cronbach's alpha signifies suitable internal consistency of the scale and correlation between items. The reliability of this scale was evaluated separately for each

In general, experiencing an interconnectedness with self, others, and God, and providing guidance in the search for life's meaning and purpose, may help patients with cancer tolerate suffering and decrease burden throughout the disease (Spatuzzi et al., 2019).

The second factor extracted, *meaningless life*, included, for example, not having joy and meaning in life and experiencing dissatisfaction about one's relationship with God. The need for meaning is a universal trait that is essential to life itself. Meaning and purpose of life impacts individuals' spiritual well-being differently depending on one's worldview. Indeed, these patients may struggle with questions about mortality or the meaning of life, possibly without coming to positive conclusions. Similar to previous studies, spiritual well-being comes from the positive emotional experience that results from one's ability to experience meaning and purpose in life through one's
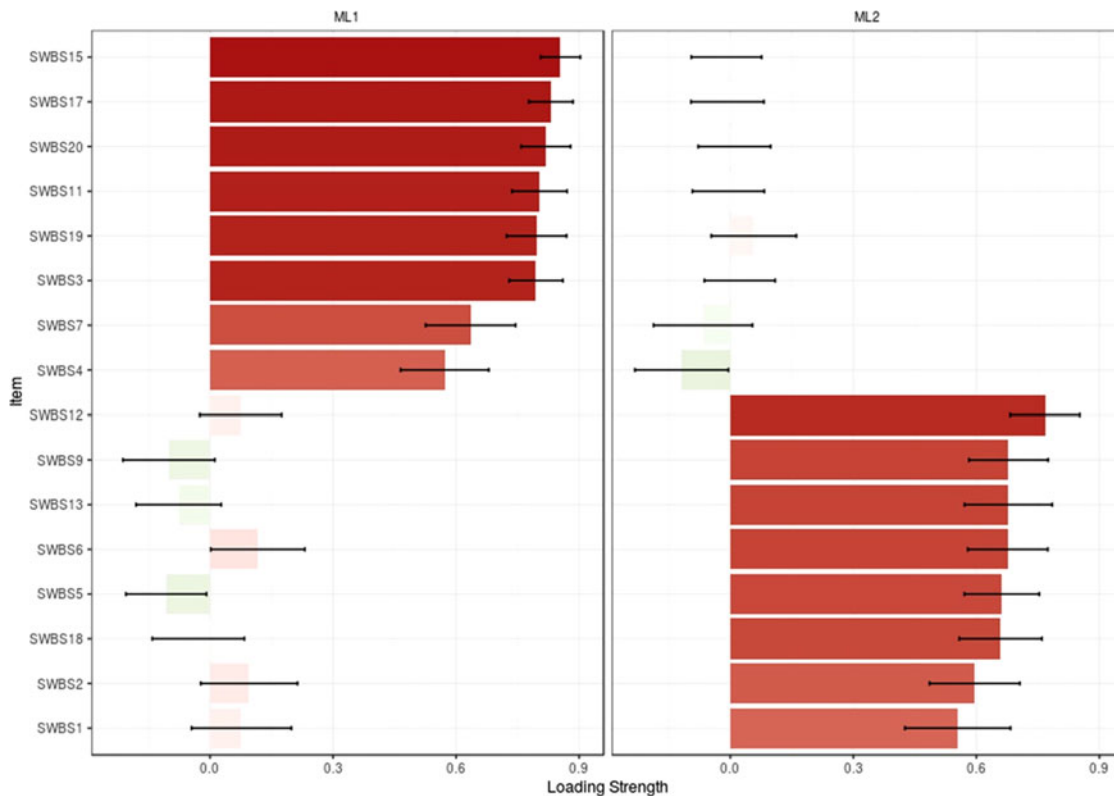
Fig. 3. Loading strength of each item.

Table 3. Fit model indices of the CFA of the Persian version of the SWBS

Model	χ^2	df	*p*-value	CMIN/DF	RMSEA	PCFI	PNFI	IFI	CFI
					Indices[a]				
CFA	211.996	100	<0.001	2.120	0.075	0.778	0.735	0.934	0.933

[a]Acceptable values are as follows: >0.5 for CMIN/DF, PCFI, and PNFI; <0.08 for RMSEA; and >0.9 for CFI and IFI.

relationship with oneself, others, and a higher power (Soleimani et al., 2017; Sajadi et al., 2018; Rabitti et al., 2020).

In the Islamic belief system, there is no difference between religion and spirituality. Religion and spirituality are largely considered the most important social factors in determining value and behavioral structures in human beings. One of the foundations of Islam is the belief in the afterlife. In accordance with these beliefs, the resurrection of the soul and body will take place on the "day of judgment" with either reward (paradise) or punishment (abyss of hell) as the final destination of every human being for eternity (Sharif Nia et al., 2015a). For patients with serious illnesses such as cancer, many consider the disease as torment or a test from God. When individuals feel that they have reached the end of their lives, they will suffer from anxiety and fear of death. Religious beliefs in these circumstances can create a positive attitude toward death, and communication with God can bring peace to these patients (Sharif Nia et al., 2015b; Komariah et al., 2020).

As the majority of Iranians are Muslim, Islamic teachings encourage people to tolerate negative life events; this particular religiosity may have a strong influence on spiritual well-being among Iranian patients with cancer. The results of this study showed that connecting with God, and creating meaning and purpose in life, explained the spiritual well-being of patients with

cancer. Spiritual care is a neglected part of holistic care that helps patients with cancer to endure the therapeutic process. Religion plays an important role in the way individuals perceive suffering and illness and potentially contributing to mental health when facing a life-threatening stressor such as cancer.

Limitation

One limitation of the present study is that while participants were cancer patients with various types of cancer, the particular type or stage of cancer was not taken into account. For example, there may be differences in the spiritual well-being of end-stage cancer patients compared with those with stage one cancer. The generalizability of the study is another limitation, since the present study focused on one geographical region and religious group. Finally, there may be information bias as the data were collected via self-report.

Implication for practice

This study has demonstrated the value of understanding the spiritual well-being of patients at very difficult times in their lives. By being able to understand patient feelings of spirituality, clinicians may be able to tailor non-medical support to the particular needs
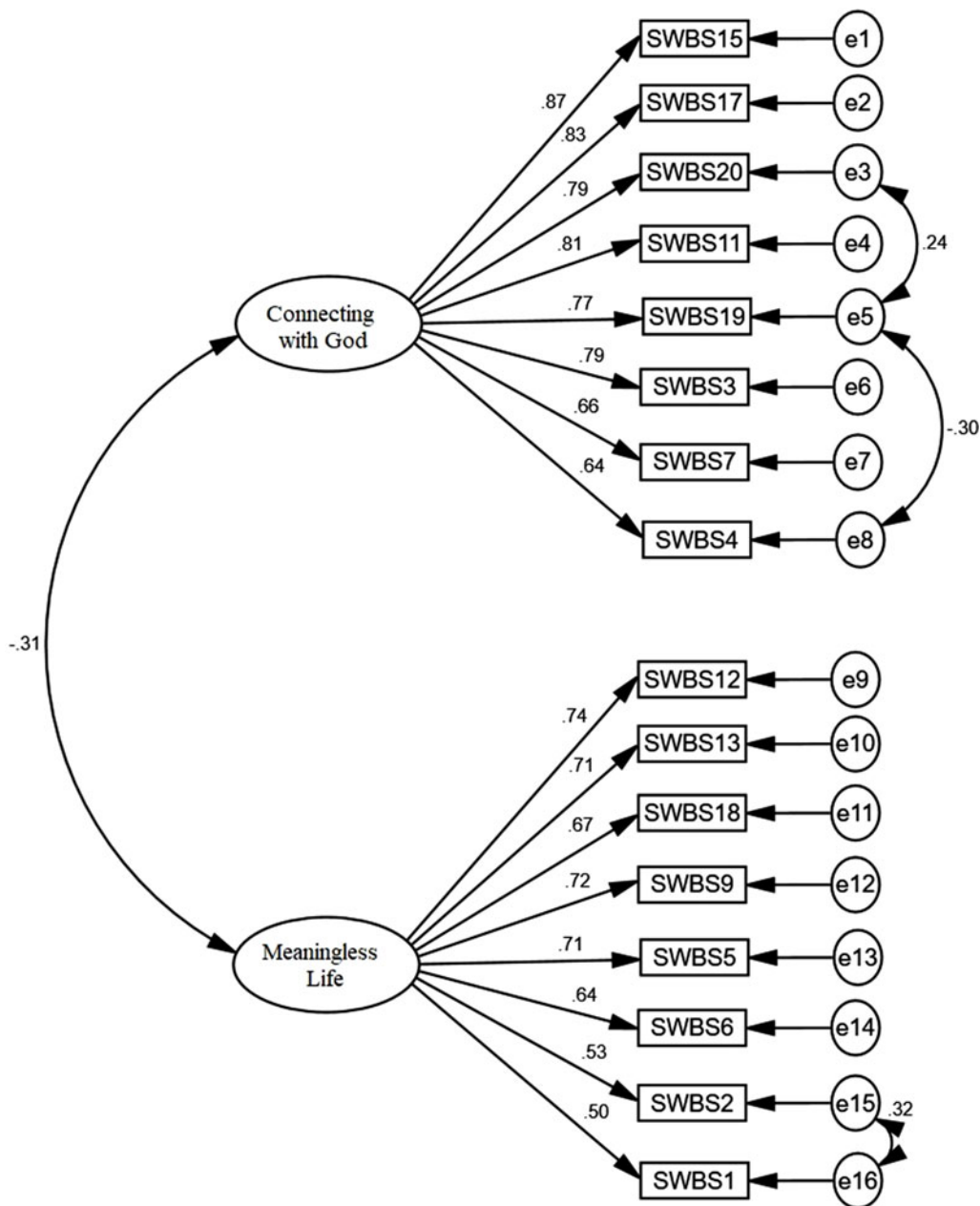
Fig. 4. Model of confirmatory factor analysis of the Persian version of the SWBS ($n = 200$).

Table 4. Internal consistency, convergent and discriminant validity, and composite reliability indices of the Persian version of the SWBS

Factors	Alpha (CI 95%)	AIC	Omega	CR	AVE	MSV
Connecting with God	0.917 (0.899–0.934)	0.589	0.922	0.921	0.598	−0.310
Meaningless Life	0.856 (0.824–0.885)	0.435	0.861	0.857	0.432	

of the patient. If spirituality is important to some patients, ensuring that this need is addressed may help with psychological as well as physical recovery.

Conclusions

The results of this study demonstrate that the Persian version of the SWBS in Iranian patients with cancer was multidimensional with two factors: *connecting with God* and *meaningless life*. These two factors explained 54.189% of the total variance of the concept of spiritual well-being in Iranian patients with cancer. The Persian version of the SWBS is a fundamental approach for measuring and improving cancer patients' health through connecting with God and creating meaning and purpose in life among Iranian patients with cancer.

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