

Original Article

Development and Psychometric Evaluation of the Spiritual Health Questionnaire among Iranian Muslim Adults

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INTRODUCTION

Health is one of the meta-paradigms of nursing with many different aspects, including spiritual health (SH).^[1,2] Therefore, one of the main responsibilities of nurses is to promote their clients' SH.^[3] SH has received great attention in recent years and has been addressed in many studies.^[4-6] Nonetheless, many ambiguities still surround the concept.^[7,8] Without clarifying the concept and

ABSTRACT

Background: Spiritual health (SH) has received great attention from nurses and other health-care providers in recent years. The existing instruments for SH measurement measure either some aspects of SH or SH-related concepts, and there is no specific SH measurement instrument, particularly for Muslim adults in Iran. **Objective:** This study aimed at the development and psychometric evaluation of the Spiritual Health Questionnaire (SHQ). **Methods:** This exploratory sequential mixed methods study was conducted in a qualitative and a quantitative phase in 2014–2016. In the qualitative phase, a concept analysis was conducted using the hybrid model and its results were used to develop the primary SHQ. In the quantitative phase, the face, content, and construct validity and reliability of SHQ were assessed. Exploratory factor analysis and concurrent validity assessment were performed for construct validity assessment. Test–retest stability and internal consistency were also assessed for reliability assessment. **Results:** The qualitative phase of the study showed that the concept of SH had six main components. In the quantitative phase, the number of primary SHQ items was reduced from 88 to 59 after face and content validity assessments. In construct validity assessment, 12 more items were excluded and the remaining 47 items were loaded on six factors which explained 45.2% of the total variance. The Cronbach's alpha values of the questionnaire and its six dimensions were 0.778 and 0.752–0.788, respectively. Convergent validity assessment showed that the mean scores of SHQ and the Spiritual Well-Being Index had a significant correlation with each other ($r = 0.35$; $P = 0.032$). **Conclusion:** The 47-item SHQ is a specific instrument for SH assessment with acceptable validity and reliability.

KEYWORDS: Adults, Methodological study, Reliability, Spirituality, Validity

providing a clear conceptual definition for it, effective strategies for SH assessment and promotion cannot be developed and used.

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There are many different instruments for SH measurement such as the Spiritual Well-Being Scale,^[9] the SH and Life-Orientation Measure,^[10] the Spirituality Index of Well-Being,^[11] and the World Health Organization Quality of Life Survey.^[12] However, most of these instruments were developed in Western countries, reflect Judeo-Christian and Western philosophical and cultural worldview, and hence may not be appropriate for SH measurement in Islamic cultures.^[13] A study highlighted that the items of SH-related instruments should originate from the immediate culture.^[14] Moreover, most existing instruments assess concepts similar to SH such as spiritual well-being, and some of them have not been developed through systematic psychometric evaluation.^[15] On the other hand, spirituality-related instruments developed in the Islamic culture of Iran measure concepts other than SH such as spiritual well-being,^[16] spiritual experience,^[17] spiritual care perception,^[18] or competency in spiritual care^[19] or their items were developed based on the existing literature.^[20] Using culturally inappropriate instruments or instruments which measure SH-related concepts provides no reliable data about SH. Consequently, despite the large population of Muslims in the world and in Iran, there is still no Muslim-specific SH measurement instrument. Therefore, the present study was conducted to fill this gap.

Objectives

The study aimed at the development and psychometric evaluation of the Spiritual Health Questionnaire (SHQ).

METHODS

Design

This exploratory sequential mixed methods study was conducted in a qualitative and a quantitative phase in 2014–2016 in Shiraz, Iran.

In the qualitative step, a concept analysis was performed through the hybrid model. The three phases of the model were the theoretical phase, the fieldwork phase, and the analytic phase. In the theoretical phase, the method proposed by Walker and Avant (1995) was used to clarify the concept of SH. The results of the theoretical phase were categorized into the main categories of the attributes, antecedents, and consequences of the concept of SH and published elsewhere.^[21]

In the fieldwork phase of the hybrid concept analysis, semi-structured interviews were held with 14 adult participants who were purposively selected with maximum variation regarding their sociodemographic characteristics. Inclusion criteria were age 18–60 years, ability to share detailed data about SH-related

experiences, no affliction by incurable illnesses, ability to speak and understand Persian, and being Muslim. Study setting was two large shopping centers, banks, retirement centers, and Shiraz University of Medical Sciences all in Shiraz, Iran. Data collection lasted 9 months. The OneNote 2007 software was used for data management.

In the final analytic phase, the results of the theoretical and the fieldwork phases were merged, SH was defined, and its dimensions and subscales were determined. The final results of the hybrid concept analysis were used to generate the item pool for SHQ.

In the quantitative step, the psychometric properties of SHQ, namely its face, content, and construct validity and reliability, were assessed.

Face validity assessment

The face validity of SHQ was assessed both quantitatively and qualitatively. In qualitative face validity assessment, interviews were held with eight faculty members and participants in order to evaluate the rationality, appropriateness, attractiveness, allocation, and comprehensiveness of the SHQ items. The questionnaire was revised based on their comments. In quantitative face validity assessment, we asked nine experts to rate the importance of each item on a five-point scale, and then, their rating scores were used to calculate the item impact score using the following formula, “Item impact score = Importance × Frequency.” In this formula, “frequency” was the number of experts who rated the intended item 4 or 5 and “importance” was the mean score of the item importance on the Likert scale.

Content validity assessment

The content validity of SHQ was also assessed both quantitatively and qualitatively. In qualitative content validity assessment, 15 clergies and experts in nursing, literature, statistics, and psychiatrics were asked to comment on the grammar and wording of the SHQ items, and then, the questionnaire was revised based on their comments. In quantitative content validity assessment, content validity ratio (CVR), item-level content validity index (CVI), and scale-level CVI were calculated.^[22] For CVR calculation, at least five experts are needed.^[23] Accordingly, 15 experts in spirituality and instrument development were asked to rate item essentiality on a three-point scale as “Essential,” “Useful but not essential,” or “Unessential.” Then, CVR was calculated through the “ $CVR = (NE - (N/2)) / (N/2)$ ” formula, where N was the total number of the experts and NE was the total number of the experts who rated the intended item “Essential.” The results were compared with the minimum critical values in Lawshe’s table.^[23] If the

CVR of an item was greater than the minimum critical value in the table, that item was considered appropriate.

For CVI calculation, the same experts were asked to rate the relevance of each item on a four-point scale. If the CVI of an item was $>75\%$, it was considered relevant. The modified kappa was also calculated as a measure of agreement among content validity assessors. Average S-CVI (S-CVI/Ave) was also calculated through averaging item CVI values. An S-CVI/Ave value >0.9 was considered acceptable.

Construct validity assessment

Exploratory factor analysis was performed for construct validity assessment. For sampling, the total frequencies of different age and gender groups in Iran were determined, and then, a proportionate sample was selected from each age and gender group through quota sampling. According to the National Statistics Center of Iran, around 23% of Iranians age 20–30 years, 17% age 30–40, 12% age 40–50, and 8% age 50–60. Moreover, 49% of Iranians are male and 51% are female.^[24] Sample size was determined based on the respondent-to-item ratio guidelines which recommend that 5–30 participants per item are needed. Another guideline suggests that a total sample of <100 participants is very small, a sample of 200 participants is fairly small, a sample of 300 participants is good, a sample of 500 participants is very good, and a sample of 1000 participants is excellent.^[25] In the present study, six participants per item were selected. The Kaiser–Meyer–Olkin statistic and the Bartlett’s test were used to test the appropriateness of the factor analysis model. Moreover, before factor analysis, a pilot study on fifty participants was conducted to assess the appropriateness of the items and identify poor items. Based on the results of that study, if the coefficient of the correlation between the score of an item and the total score of the questionnaire was <0.3 , that item was removed.^[26]

The convergent validity of SHQ was also assessed through assessing the correlation between the total score of SHQ and the total score of the Spiritual Well-Being Index.^[9] This index measures spiritual well-being in the two dimensions of religious and existential well-being. It includes forty items scored on a Likert scale from 1 (“Strongly disagree”) to 6 (“Strongly agree”), resulting in a total dimensional score of 10–60 and a total score of 20–120. Higher scores reflect greater sense of well-being. Reliability assessment using the data obtained from 100 students in a former study showed that the test–retest correlation coefficients of the index and its religious and existential well-being dimensions were, respectively, 0.93, 0.96, and 0.86, which confirm the acceptable reliability of the index.^[27] The Cronbach’s

alpha of the index was 0.90 in a former study on university students in Iran^[28] and 0.742 in the present study. Thirty-eight participants completed both SHQ and Spiritual Well-Being Index, and then, the correlation between the scores of these two instruments was assessed.

Reliability assessment

The internal consistency and the stability assessment methods were employed for assessing the reliability of SHQ. Accordingly, Cronbach’s alpha was calculated at two time points, namely after face and content validity assessments using the data obtained from 42 participants and after factor analysis using the data obtained from 322 participants.

Stability was assessed through the test–retest method, in which 54 participants twice completed the questionnaire with a 2-week interval. Then, intraclass correlation coefficient was calculated and values >0.80 were interpreted as acceptable stability.^[29] It is noteworthy that a sample of thirty participants is adequate for stability assessment.^[26]

Ceiling and floor effects were also assessed for SHQ. These effects exist when more than 20% of participants, respectively, obtain the highest and the lowest possible scores of the intended instrument.^[30]

Quantitative data analysis was performed using the SPSS software (SPSS for Windows, Version 16.0. Chicago, SPSS Inc.), and the level of significance was set at <0.05 .

Ethical considerations

The Ethics Committee of Shiraz University of Medical Sciences, Shiraz, Iran, approved this study (Ethical approval code: IR.SUMS.REC.1393.S7216, Grant number: 93.7216). Participants were primarily informed about the aim and the methods of the study, confidential management of the study data, and their freedom to withdraw from the study. Then, written informed consent was obtained from all of them.

RESULTS

The results of the qualitative step

In the theoretical phase of the hybrid concept analysis, 436 documents were reviewed. The experiences of 14 participants of the fieldwork phase showed that SH is a complex and multidimensional concept. The results of this phase also showed that the major components of SH were harmonious reciprocal connectedness, moderation, spiritual striving, transcendence, purpose seeking and wisdom thinking, and faith.^[31] The novel findings of this phase of the study were moderation in life and communications, spiritual striving, spiritual thinking, and deep contemplation

into the inner self. Based on the results of this phase, SH was defined from the perspectives of Iranian Muslim adults. In the analytic phase of the hybrid concept analysis, the results of the first and the second phases were combined. Finally, the concept of SH was defined as “a dynamic, developmental, conscious, multidimensional, and universal process that stimulates transcendence through spiritual awareness, personal capacity, and potentials, has the characteristics of integrating force for existential aspects, transcendence and moderation, harmonious connectedness, wisdom thinking, purpose seeking, and faith, and results in physical, psychosocial, and spiritual well-being and moral development.” Table 1 presents the results of this step. Based on this definition, a pool with 88 items was generated for the primary SHQ.

The results of the quantitative step

In this step, 387 Iranian adults with a mean age of 35.00 ± 11.55 were studied. Most of them were

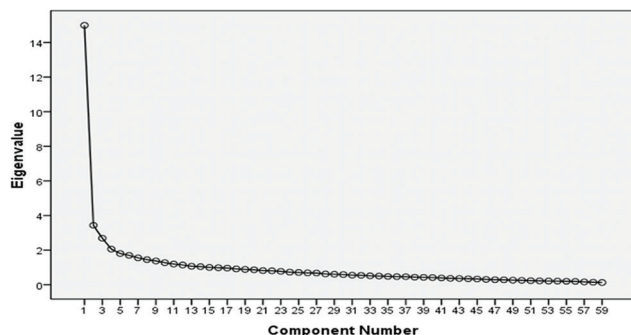


Figure 1: Scree plot based on factor loading values equal to 0.4

Table 1: The themes and subthemes of the qualitative step of the study

Themes	Subthemes
Harmonious reciprocal connectedness	Connectedness with God
	Connectedness with self
	Connectedness with others
	Connectedness with nature
Moderation	Harmonious reciprocal relationships
	Moderation in personal issues
	Moderation in social issues
Spiritual striving	Abstinence
	Spiritual thinking and contemplation
	Self-reflection
Transcendence	To be in the “becoming” pathway
	Spiritual development
	Spiritual flourishing
Purpose seeking and wisdom thinking	Becoming purposeful
	Considering divine wisdom
Faith	Internal faith
	External faith

female (58.1%), married (63%), and employed (71.3%), and 42.9% of them had high school diploma [Table 2].

Face and content validity assessments

During face validity assessment, two items were merged with each other and nine items were deleted due to importance scores <1.5. In content validity assessment, 11 items had low CVR scores [Table 3] and 8 had low CVI and modified Kappa values [Table 4]. After removing these items, the S-CVI/Ave of the 59-item SHQ was calculated to be 0.93.

Construct validity assessment

The correlation coefficients of the mean scores of ten items (i.e., items 5, 10, 15, 23, 26, 36, 39, 43, 53, and 59) with the total score of SHQ were <0.3, and hence, these ten items were excluded. The Kaiser–Meyer–Olkin statistic for sampling adequacy assessment was 0.903, and the result of the Bartlett’s test for assessing the sphericity of the item matrix was statistically significant ($P < 0.001$). During exploratory factor analysis using the maximum likelihood method and varimax orthogonal rotation, two items were deleted

Table 2: Demographic characteristics of participants in the quantitative phase of the study (n = 387)

Characteristics	n(%)
Gender	
Female	225 (58.1)
Male	162 (41.9)
Marriage status	
Single	134 (34.6)
Married	244 (63)
Not answered	9 (2.4)
Education	
Illiterate	67 (17.3)
High school diploma	90 (23.3)
Bachelor degree	166 (42.9)
Master's degree	40 (10.3)
PhD	17 (4.4)
Not answered	7 (1.8)
Age (Year) (mean)	34.98±11.55
19-29	122 (31.5)
30-39	126 (32.6)
40-49	61 (15.8)
50-60	46 (11.9)
Not answered	32 (8.2)
Occupational status	
Housekeeper	104 (26.8)
Worker, shopkeeper	106 (26.7)
Employee	80 (20.7)
College professor	21 (5.4)
College student	62 (16)
Retired	7 (1.8)
Not answered	7 (2.6)

Table 3: Items with low content validity ratio values

Items	CVR	Decision
Artistic activities such as playing music draw me closer to god	0.25	Deleted
Artistic activities strengthen my faith	0.33	Deleted
Prayer increases my spiritual awareness	0.2	Deleted
Praying activities are important in my life	0.6	Preserved
My existence bonds with other human beings	0.56	Deleted
My soul boundaries extend along with improvement in my spirituality	0.42	Deleted
Knowing and following spiritual patterns help me achieve transcendence	0.42	Deleted
I'm proud of myself when I reach higher levels of religious faith and beliefs	0.47	Deleted
I have discovered that life has a satisfying and persuasive purpose	0.33	Deleted
I feel as if I have found my purpose in life	0.5	Preserved
I feel balance in my life	0.25	Deleted
All aspects of my existence grow in harmony	0.2	Deleted
The different aspects of my life do not conflict with each other	0.47	Deleted

CVR: Content validity ratio

Table 4: Spiritual Health Questionnaire items with low content validity index and modified Kappa values

Items	CVI	Kappa statistics	
		Value	Interpretation
My existence bonds with other human beings	0.25	0.16	Weak
I am trying hard to maintain my spiritual health	0.67	0.7	Good
Praying activities are important in my life	0.67	0.87	Excellent
I can't make my spiritual health better	0.71	0.89	Excellent
The emergence of my intrinsic capabilities gives me the feeling of being productive and flourishing	0.78	0.72	Good
Creativity is not attractive to me	0.66	0.69	Good
I usually have enthusiasm for life	0.71	0.93	Excellent
I feel harmony with the nature and the universe as they are	0.72	0.65	Good

CVI: Content validity index

and the remaining 47 items were loaded on six factors with Eigenvalues >1 and factor loading values >0.4. Scree plot also confirmed the six-factor structure of the SHQ [Figure 1]. The extracted six factors of SHQ explained 45.2% of the total variance. Items which were loaded on two factors were allocated to the factor with greater factor loading. Another criterion for the allocation of such items was congruence between their content and the content of the loaded factors. Accordingly, the items "I feel satisfied with individual prayer" and "My extra attention to one aspect of life causes me to neglect other aspects" were transferred from Factor 5 to Factor 4. Finally, factors were labeled according to their items as follows: transcendental connectedness, harmonious reciprocal relationships, transcendence, moderation, faith, and purposefulness and meaningfulness [Table 5]. Convergent validity assessment showed that the coefficient of the correlation between the total mean scores of SHQ and the Spiritual Well-Being Index was 0.35 ($P = 0.032$).

Reliability assessment

The Cronbach's alpha of SHQ before factor analysis was 0.749. After factor analysis, the Cronbach's alpha values

of the final SHQ and its transcendental connectedness, harmonious reciprocal relationships, transcendence, moderation, faith, and purposefulness and meaningfulness dimensions were 0.778, 0.783, 0.774, 0.752, 0.766, 0.766, and 0.778, respectively [Table 6]. Stability assessment also showed no significant difference between the mean scores of SHQ at the two measurements ($P = 0.182$) and revealed that the test-retest intraclass correlation coefficient of SHQ was 0.959 with a 95% confidence interval of 0.931–0.976 ($P < 0.001$), confirming the acceptable reliability of the questionnaire.

The relative frequency of participants which obtained the highest and the lowest possible scores of SHQ was 30.7% (102 participants) and 0.3% (one participant), respectively.

DISCUSSION

In this study, SHQ was developed and its psychometric properties were assessed. Findings showed that the questionnaire has six main dimensions, namely transcendental connectedness, harmonious reciprocal relationships, transcendence, moderation, faith, and purposefulness and meaningfulness. While transcendental

Table 5: The results of varimax rotation (factor analysis) and factor loadings of each items

Items	Factors			
	Transcendent connectedness	Faith connectedness	Purposefulness and meaningfulness	Harmonious mutual relationships
I believe in God	0.632			
I believe in Holy Quran and prophets	0.598			
Bonding to God, makes my soul to be more perfect	0.632			
I try to maintain my connection with God	0.628			
I get rid of loneliness through the connection with God	0.552			
Relationship with God does not make me peaceful	0.649			
I trust and rely on God in my difficult times of life	0.703			
I believe that God is looking for and taking care of me	0.628			
When I think about the creation of human and the universe, I realize the greatness of God	0.633			
I feel satisfied with personal prayer		0.495		
I enjoy from group prayer		0.65		
I believe being in mystic/spiritual activities and groups such as mosques can provide spiritual support		0.697		
I always do my religious regulations		0.41		
I do my religious Mustahabbat as far as I can		0.498		
During a year, I try to participate in religious ceremonies		0.674		
I try to give sadagha and charities during a year		0.486		
I know the origin and purpose of the existence			0.522	
I have plans for the future			0.682	
I believe the life is monotonous and repetitious			0.695	
I believe the life in meaningless			0.597	
Spiritual forces can help me to deal with physical and psychological diseases				0.619
I can recover from physical and psychological diseases with the help of spiritual forces				0.672
I believe that spirituality is the core and the pivot of the other aspects of my health				0.705
Spiritual health makes my inner existence, cohesive and coordinated				0.729
My excessive attention to one aspect of life causes me to neglect other aspects of my life				0.42
I don't indulge or act excessive in my behavior, thoughts, speaking and grooming				0.615
In decisions regarding religious matters, I act without prejudice				0.442
55 In social relationships, I act with moderation and without excessive				0.472
I avoid violating the rights of other people and hurting them				0.592
I believe that we should not have to act with excessive in confronting with other religions and people				0.616
I try to do with justice and impartiality in all my social affairs such as trades				0.446
I feel that with time and my experiences, I move toward transcendence				
I believe that my spiritual believes make me more perfect				0.53
I feel some special events and crises might improve and transform spiritual health				0.549
The bitter and sweat life events make my faith and believes stronger				0.557
				0.489

Contd...

Table 5: Contd...

Factors		Harmonious mutual relationships
Items	Transcendent connectedness	Purposefulness and meaningfulness
I feel satisfied using my abilities with the help of faith and spiritual believes		0.574
I feel useful by understanding and using innate capabilities through spiritual forces		0.43
I have an awakened conscience		0.54
In my daily activities, I consider some time to think about my behaviors and thoughts		0.689
I try to know myself more and more		0.624
I fell love and kindness for other people		0.631
I do my "devotion to relatives" responsibilities		0.591
I enjoy helping people		0.588
Watching God creatures make me wonder		0.572
I feel responsible to take care of the nature		0.639
I never feel bored thinking of and learning from the universe		0.572
Relationship with God creatures made me transcendent		0.51
I feel that with time and my experiences, I move toward transcendence		0.53
I believe that my spiritual believes make me more perfect		0.549
I feel some special events and crises might improve and transform spiritual health		0.557

Table 6: Intraclass correlation coefficients of Spiritual Health Questionnaire and its dimensions

Dimensions	ICC	95% CI	P	SEM
Transcendental connectedness	0.728	0.573-0.833	<0.001	2.68
Harmonious reciprocal relationships	0.937	0.895-0.963	<0.001	1.8
Transcendence	0.841	0.742-0.904	<0.001	1.2
Faith	0.871	0.788-0.922	<0.001	2.08
Purposefulness and meaningfulness	0.813	0.698-0.887	<0.001	1.32
Moderation	0.888	0.817-0.933	<0.001	1.43
Total	0.959	0.931-0.976	<0.001	3.45

CI: Confidence interval, SEM: Standard error of measurement, ICC: Intraclass correlation coefficient

connectedness was a subcategory of the harmonious reciprocal connectedness in the hybrid concept analysis in the present study, construct validity assessment through exploratory factor analysis revealed it as a main dimension of SHQ, indicating the importance of transcendental connectedness in the Islamic culture of Iran.

Internal consistency assessment revealed that the Cronbach's alpha values of SHQ and its dimensions were more than 0.75, confirming the acceptable reliability of SHQ. Previous studies also reported great Cronbach's alpha values for other SH-related instruments.^[9,20,32] The test-retest stability assessment in the present study also showed that the test-retest intraclass correlation coefficients of SHQ and its dimensions were >0.7, confirming the acceptable stability of the questionnaire over time.

Many different instruments are used for the measurement of SH. However, most these instruments measure concepts similar to SH such as spiritual well-being, daily spiritual experience, and spirituality,^[33,34] and hence, they do not help nurses differentiate SH from its similar concepts. Moreover, SH-related instruments developed in Iran are mainly based on the existing literature rather than contextual data and hence are not perfectly appropriate for the Iranian context.^[20,32] For example, the Sayemiri *et al.*'s instrument for SH measurement includes the following two items, "Healthy thinking depends on discovering a supreme being who guarantees the rules and the traditions of the existence" and "Compared with secular lifestyle, worshipping or religious lifestyle is an abstract and unattainable system." These items are not perfectly appropriate for the religious context of Iran. On the other hand, most existing SH-related instruments have been developed in Western cultures and under the influence of Judeo-Christian worldview.^[35] Instruments, particularly instruments related to religious beliefs, should be developed based on the characteristics and values of the immediate context; otherwise, they

may produce unreliable results when used in different contexts. In addition, the existing SH-related instruments contain items on the antecedents and consequences of SH such as belief system and mortality, while they do not cover some aspects of SH such as moderation and the existence of an integrating force in the universe. Contrarily, the SHQ developed in the present study exclusively includes items on the attributes of SH which were generated based on the findings of the qualitative step and covers moderation and the existence of an integrating force in the universe.

Before construct validity assessment, ten items were excluded because the coefficients of the correlation between their mean scores and the total mean score of SHQ were <0.3 . The content of some of these items had been addressed in other items. Examples of these items were as follows: “My beliefs play an important role in my life,” “The pleasure I get from worshiping separates me from my everyday problems,” and “Spirituality promotes my soul.” Moreover, some of the excluded items were too abstract and difficult to understand for participants. Examples of these items were as follows: “I know my shortcomings and abilities to achieve my goals,” “When I face problems, I feel doubtful about God’s wisdom,” “I don’t get tired in moving towards perfection,” and “Barriers in life don’t stop me in my way towards perfection.” Excluding these items enhanced participants’ understanding of the questionnaire.

One of the strengths of SHQ is its very low floor effect which means that the questionnaire can discriminate participants with low levels of SH. Another strength of the questionnaire is its development based on the Islamic context of Iran. Individuals’ worldviews and beliefs significantly affect their perceptions of SH. Therefore, instruments for SH measurement should be developed based on the worldviews of the target population. Most existing SH-related instruments have been developed based on the Judeo-Christian worldview about spirituality which was formed after the Second World War. Despite similarities among Islam, Christianity, and Judaism, these religions widely differ from each other regarding the manifestations of spirituality. For example, unlike other studies, our study revealed moderation, spiritual striving, and deep inward contemplation as the components of SH. The primary item pool of SHQ also included 88 items, and hence, it was strong enough. Considering the probability of item exclusion during psychometric analysis, the primary item pool of an instrument should include large number of well-developed items. The inclusion of negatively worded items was another strength of

SHQ. Psychometric specialists believe that negatively worded items can better reflect respondents’ views. Moreover, the mixed methods design of the study and the triangulation of the study data helped collect and present more in-depth data, ensure credibility, and develop a more reliable instrument. Study participants were also selected with maximum variation in order to include a wide range of ideas and experiences in the study.

One of the main limitations of the present study was the similarity of the concept of SH with some other concepts such as spirituality and spiritual well-being which might have caused problems for participants in understanding the concept. Moreover, study participants were selected just from urban areas. Therefore, despite sampling with maximum variation, study findings may not easily be generalizable to people in rural areas. Further studies are recommended to assess the psychometric properties of SHQ in different urban and rural populations.

CONCLUSION

This study concludes that the 47-item SHQ has acceptable validity and reliability for SH measurement among Iranian Muslim adults. SHQ is not only a culturally appropriate instrument for SH measurement in Iran but also has good psychometric properties compared with other SH-related instruments in the country. This questionnaire is specific for SH rather than SH-related concepts such as spirituality, spiritual well-being, and SH outcomes. SH measurement using SHQ can provide valuable information for nurses and other health-care providers and enable them to develop strategies for SH improvement. As psychometric evaluation of an instrument is an endless process, further studies are needed to provide more conclusive results about the psychometric properties of SHQ.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Kyngäs H. Theory development from the results of content analysis. In: Kyngäs H, Mikkonen K, Kääriäinen M, editors. *The application of content analysis in nursing science research*. Cham: Springer; 2020. p. 73-84.
- McEwen M, Wills EM. *Theoretical Basis for Nursing: Lippincott Williams & Wilkins*. 4th ed. Philadelphia: Wolters Kluwer; 2017.
- Potter PA, Perry AG, Stockert P, Hall A. *Fundamentals of Nursing-E-Book*. Philadelphia: Elsevier Health Sciences; 2020.
- Shaygan M, Shayegan L. Understanding the relationship between spiritual well-being and depression in chronic pain patients: The mediating role of pain catastrophizing. *Pain Manag Nurs* 2019;20:358-64.
- Vizehfar F, Jaberi A. The relationship between religious beliefs and quality of life among patients with multiple sclerosis. *J Relig Health* 2017;56:1826-36.
- Momennasab M, Shadfard Z, Jaberi A, Najafi SS, Hosseini FN. The effect of group reflection on nursing students' spiritual well-being and attitude toward spiritual care: A randomized controlled trial. *Invest Educ Enferm* 2019;37:e09.
- Selman L, Siegert R, Harding R, Gysels M, Speck P, Higginson IJ. A psychometric evaluation of measures of spirituality validated in culturally diverse palliative care populations. *J Pain Symptom Manage* 2011;42:604-22.
- Gall TL, Malette J, Guirguis-Younger M. Spirituality and religiousness: A diversity of definitions. *J Spirit Mental Health* 2011;13:158-81.
- Ellison CW. Spiritual well-being: Conceptualization and measurement. *J Psychol Theol* 1983;11:330-40.
- Fisher J. Development and application of a spiritual well-being questionnaire called SHALOM. *Relig* 2010;1:105-21.
- Daaleman TP, Frey BB. The Spirituality Index of Well-Being: A new instrument for health-related quality-of-life research. *Ann Fam Med* 2004;2:499-503.
- The-WHOQOL-Group. The World Health Organization Quality of Life Assessment (WHOQOL): Development and general psychometric properties. *Soc Sci Med* 1998;46:1569-85.
- Koenig HG, Al-Shohaib S. *Health and Well-Being in Islamic Societies*. New York: Springer; 2015.
- Squires A, Aiken LH, van den Heede K, Sermeus W, Bruyneel L, Lindqvist R, *et al.* A systematic survey instrument translation process for multi-country, comparative health workforce studies. *Int J Nurs Stud* 2013;50:264-73.
- Abbasi M, Azizi F, Shamsi-Gooshki E, Naseri Rad M, Akbari Lake M. Conceptual definition and operationalization of spiritual health: A methodological study. *Iranian J Med Ethic* 2012;6:11-44.
- Khorami-Markani A, Yaghmaie F, Khodayari-Fard M, Alavi Majd H. Developing a measure for assessing oncology nurses' attitudes toward providing spiritual care: Psychometric properties. *Payesh* 2013;12:393-402.
- Ghobari-Bonab B, Lavasani Gh, Mohammadi MR. Developing a spiritual experience scale for college students. *J Psychol* 2005;9:261-78.
- Iranmanesh S, Tirgari B, Cheraghi MA. Developing and testing a spiritual care questionnaire in the Iranian context. *J Relig Health* 2012;51:1104-16.
- Adib-Hajbaghery M, Zehtabchi S. Developing and validating an instrument to assess the nurses' professional competence in spiritual care. *J Nurs Meas* 2016;24:15-27.
- Sayehmiri K, Taghinejad H, Tavan H, MousaviMoghaddam R, Mohammadi I, Ahmadi Z. Validation study of spiritual health questionnaire from Islamic view. *Med Sci J Islamic Azad Univ* 2016;26:109-15.
- Jaberi A, Momennasab M, Yektatalab S, Ebadi A, Cheraghi MA. Spiritual health: A Concept analysis. *J Relig Health* 2019;58:1537-60.
- Waltz CF, Strickland OL, Lenz ER. *Measurement in Nursing and Health Research*. New York: Springer Publishing Company; 2010.
- Ayre C, Scally AJ. Critical values for Lawshe's content validity ratio: Revisiting the original methods of calculation. *Meas Evaluat Couns Devel* 2014;47:79-86.
- Presidency of the IRI Plan and Budget Organization. *National Population and Housing Statistics*. Iran-Tehran: Presidency of the IRI Plan and Budget Organization; 2015.
- Fabrigar LR, Wegener DT. *Exploratory Factor Analysis*. New York: Oxford University Press; 2011.
- Ebadi A, Zarshenas L, Rakhshan M. *Principles of Scale Development in Health Science*. 1st ed. Tehran: Jame-e-Negar; 2017.
- Bufford RK, Paloutzian RF, Ellison CW. Norms for the spiritual well-being scale. *J Psychol Theol* 1991;19:45-70.
- Dehshiri GH, Sohrabi F, Jafari E, Najafi M. Psychometric assessment of Spiritual well-being Scale in college students. *Psychol Stud* 2008;16:129-45.
- Streiner DL, Norman GR, Cairney J. *Health Measurement Scales: A Practical Guide to their Development and Use*. Oxford: Oxford University Press, USA; 2015.
- Plichta SB, Kelvin EA, Munro BH. *Munro's Statistical Methods for Health Care Research*. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2013.
- Jaberi A, Momennasab M, Cheraghi M, Yektatalab S, Ebadi A. Spiritual health as experienced by Muslim adults in Iran: A qualitative content analysis. *Shiraz E Med J* 2019;20:e88715.
- Amiri P, Abbasi M, Gharibzadeh S, Asghari Jafarabadi M, HamzaviZarghani N, Azizi F. Designation and psychometric assessment of a comprehensive spiritual health questionnaire for Iranian population. *Iranian J Med Ethic* 2015;8:25-55.
- Underwood LG. The daily spiritual experience scale: Overview and results. *Relig* 2011;2:29-50.
- Unterrainer HF, Ladenhauf KH, Moazedi ML, Wallner-Liebmann SJ, Fink A. Dimensions of religious/spiritual well-being and their relation to personality and psychological well-being. *Pers Individ Diff* 2010;49:192-7.
- Hedstrom M. *The Construction of "Judeo-Christian" Spirituality in Postwar America* 2013. Available from: http://citation.allacademic.com/meta/p105728_index.html. [Last accessed on 2015 Feb 11].