

Psychometric Properties of the Persian Version of Spiritual Leadership Questionnaire (SLQ): A Methodological Study

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Abstract

Background: Spiritual leadership has recently become the focus of attention for policy makers and top managers in Iran, especially in the health system. Due to the lack of culturally and academically accepted scales in Iran for measuring spiritual leadership, localization of a foreign scale in this field is necessary.

Objectives: This study aimed at investigating the validity and reliability of the Persian version of Fry's spiritual leadership questionnaire (SLQ) among Iranian nurses.

Methods: The present cross sectional methodological research was conducted during year 2016. Participants were 400 nurses working in teaching hospitals affiliated to 3 universities of medical sciences in Tehran, Iran, who were selected using stratified sampling. A standard forward-backward translation procedure according to Wild et al. (2005) was used to translate the English version of the SLQ to Persian. The psychometric evaluation processes were achieved by face, content, and construct validity (confirmatory factor analysis). Reliability was examined using test-retest and Cronbach's alpha for internal consistency reliability.

Results: The SLQ showed good content validity (CVI = 0.94) ranging from 0.79 to 0.94 for each of the items. Construct validity evaluation by confirmatory factor analysis (CFA) led to extraction of 8 factors from data was confirmed with acceptable values (factor-loading values ranged from 0.32 to 0.95). The original model was presented and incorporated in the CFA, indicating an acceptable fit for the model (root mean square error of approximation (RMSEA) = 0.08; comparative fit index (CFI) = 0.91; normed fit index (NFI) = 0.90; and incremental fit index (IFI) = 0.95). Cronbach's alpha coefficient for the total scale was 0.94 and for each component ranged from 0.71 to 0.86, indicating good internal consistency, and the intraclass correlation coefficients (ICC = 0.92) showed good test-retest reliability.

Conclusions: The Persian version of Fry's spiritual leadership questionnaire has acceptable psychometric properties for measuring spiritual leadership style of Iranian nurse managers and helps detect and predict the extent and scope of the application of this new type of leadership to improve organizational outcomes.

Keywords: Spirituality, Leadership, Psychometrics, Questionnaire, Nurses

1. Background

Occupation constitutes an important part of every one's life (1) and people seek purpose and meaning in their work in order to improve the quality of their life (2). Successful leaders create motivation in their employees by creating significance in their work and fostering a sense of belonging in them (3). Leadership implies a sense of power and authority, and is also associated with emotional communication, originality, and spiritual values (4).

Of all the new available leadership theories, the spiritual leadership theory has attracted a much attention from researchers in response to the need for significance and

spirituality in work (5). The spiritual leadership theory is a causal theory based on the development of intrinsic motivation in the employees (6) that emerges from the interaction between the leader's vision and his attention to the members of the organization (love and altruism) (7). It creates a sense of significance, purposefulness, and distinction in the employees by creating an excellent vision of serving others and making them feel appreciated by creating a culture based on altruistic values, fostering care, respect, and gratitude toward themselves and others (8). Researchers believe that spiritual leadership is essential for providing the basic needs of both employees and leaders, including spiritual welfare, significance, and membership,

and contributes to the achievement of positive personal and spiritual outcomes (9).

Spiritual leadership has recently attracted the attention of Iranian researchers in health-care system and has been investigated in various research domains. Hence, it is necessary to assess the status of spiritual leadership in nursing (10-12). Today, this type of leadership has led to great outcomes for nursing managers and nurses. Spiritual leadership has the potential to make a difference in the nursing environment and help develop, maintain, and improve productivity, and provide a way to create meaning and purpose in work for nurses. The positive outcomes of spiritual leadership help improve work conditions for nurses and lead to better patient care as well as better services for all other people affected by the outcomes of this type of nursing leadership (13).

In doing so, the use of valid and reliable instruments, including various categories of this concept, is of utmost importance. On the basis of the search for an acceptable spiritual leadership questionnaire, it was determined that Fry's spiritual leadership questionnaire is the best option with 35 items and high reliability and validity indices used in numerous studies around the globe to measure spiritual leadership in various fields (1, 11, 14-17). In fact, no other instrument for measuring the concept and dimensions of spiritual leadership was found in Iran or any other country. There is no need for any other questionnaire to measure this model, thus it has been used in many studies (1, 16, 18).

Regarding the importance of spiritual leadership in nursing, validation of a spiritual leadership instrument in Iran and provision of sufficient information on its psychometric process is mandatory. However, in reviewing spiritual leadership studies, no study was found in Iran to have specifically performed the psychometric measurement of the spiritual leadership questionnaire. The studies conducted on the effect of spiritual leadership on individual and organizational consequences using the spiritual leadership questionnaire have omitted the category of "inner life" from the questionnaire, while this variable is one of the important categories of spiritual leadership that according to Fry et al. (2016) (1), plays the role of a motive force for spiritual leadership. On the other hand, there are no reports on the translation and back-translation processes of this inventory and also on its face validity and content validity (10, 11, 19).

Regarding the sociocultural context of Iran in which spirituality is of great importance for people and organizations, the translation and cultural matching of an instrument for which the validity and reliability indices are established, according to the Iranian norms, is necessary. Such an instrument should also be matched for and ad-

justed with the original one.

Instrument psychometric process ensures the scholars and researchers of the validity and generalizability of the findings of the study (20). In the studies carried out in Iran in the nursing field to examine the correlation between spiritual leadership and its individual and organizational consequences, the researchers have studied areas of Fry's questionnaire, yet, none of them has performed the localization and psychometrics of the entire instrument (12, 19, 21).

The existence of the Persian version of Fry's spiritual leadership questionnaire following the processes of translation and psychometrics provides various hospital wards, specifically the nursing managers, with the opportunity to analyze the potential leadership situations and prepare the conditions for spreading this new style of leadership in health-care systems, through teaching and making a socio-cultural infrastructures among the managers and personnel. Moreover, regarding the short history of the studies related to nurses' spiritual leadership, the application of the Persian version of the instrument in various study fields can trigger research that will be conducted in the health-care system. This study was part of a large study aimed at examining Fry's model of spiritual leadership (SLT) in the nursing society of the country. Consequently, this study aimed at translation, localization, and psychometrics of Fry's spiritual leadership questionnaire in the context of Iranian nursing services.

2. Methods

2.1. Study Design

This study was a cross sectional research. The research design included a translation procedure and psychometrics evaluation consisting of face and content validity, and assessment of construct validity and reliability (22).

2.2. Sample and Procedure

The population under study included nurses, head nurses, and supervisors employed in teaching hospitals, state hospitals, referral hospitals, and +200-bed hospitals, affiliated to medical universities of Tehran (Shahid Beheshti University of Medical Sciences, Tehran University of Medical Sciences, and Iran University of Medical Sciences). The data were collected in Tehran, Iran, in 2016 during the 3 summer months. To do so, first a list of teaching hospitals and centers affiliated to medical universities of Tehran with specialty and general wards (i.e., internal medicine, surgery, obstetrics and gynecology, pediatrics, infection, intensive care unit (ICU), urology, and orthopedics) was prepared. Then, to observe the geographical scattering of the hospitals for maximal variety in location and

type, hospitals and centers located in 4 geographical zones of Tehran (north, south, east, and west), which were not single-specialty, were selected. These hospitals announced their readiness for participation in the study. The number of samples in each hospital was determined on the basis of volume of nurses in that center. Next, nurses, who qualified for inclusion in the study were randomly selected and entered in the study. The inclusion criteria were holding at least a nursing bachelor of Science (BS) degree, at least 2 years of work experience, and employment at various wards and shifts. These criteria were set to ensure of nurses' sufficient experience in leadership status and management at their location and also to produce maximal variety and generalizability through selecting all wards and shifts. The inclusion criterion for head nurses and supervisors was at least 2 years of work experience in the current ward. The exclusion criterion was lack of cooperation for participation in the study. The participants could leave the study at any stage.

Although there are no clear rules specifying the sample size required for factor analysis, the recommended size was 5 to 10 per item in the tool being assessed (23). Given that the questionnaire used in this study had 35 items, the sample size was estimated as 350, yet to account for a 20% probability of returning incomplete questionnaires and to ensure an acceptable sample size, a total of 440 questionnaires were ultimately distributed and 400 of them were assessed. For 2 questionnaires, 3 items were not answered, the missing data of which were corrected via multiple imputation.

2.3. Ethical Consideration

To observe ethical principles in the research, the ethics code of SBMU2.REC.1394.116 dated 26.9.2015 was granted by the ethics committee of research at the university and the required permissions were obtained from the authorities at the mentioned universities and hospitals. At first, the research objectives and procedures were elucidated for the participants. Then, oral and informed written consents were obtained from each participant. The researchers observed anonymity, information confidentiality, and the right to leave the study at any stage.

2.4. Instrument

Fry's spiritual leadership questionnaire was developed in 2005 in the form of a 5-point Likert scale (strongly agree = 5 to strongly disagree = 1) and was revised several times. The last version of the questionnaire was developed in 2008, and the researchers received this version from the developer to conduct this study. The questionnaire consists of 35 items with the following categories:

vision (4 items), faith and hope (4 items), and altruism (5 items) based on studies by Fry et al. (6) (2005); inner life (5 items), calling (4 items), and membership (4 items) based on the spirituality at work questionnaire by Ashmos and Duchon (2000); organizational commitment (5 items) based on Allen and Meyer's organizational commitment scale (1990); and finally productivity (4 items) based on the productivity scale developed by Nyhan (2000); (1, 24-26)

2.5. Translation Method

At this stage, after correspondence with the developer of the questionnaire and asking for his permission, the process of translation and psychometric assessment began based on the model proposed by Wild et al. (27). First, written consent to translate the questionnaire and use it for the study was obtained from its original developer. Next, the original questionnaire was translated from English to Persian by 2 people fluent in Persian and proficient in English-to-Persian translation. The 2 translations were then compared and converted to a final version. In the next step, the Persian version was translated back to English by 2 people fluent in both languages, who were not in contact with the 2 other translators, one of whom was a native English speaker. The 2 translations were compared by an observer in terms of consistency with the initial questionnaire. This version was then sent to the original developer of the questionnaire to obtain his opinion; after the recommended revisions were made, the back translation of the questionnaire was once again sent to the developer to confirm the final version. After these steps, the validity and reliability of the questionnaire were evaluated.

2.6. Content Validity

For assess content validity, only the content validity index was calculated, because, unlike questionnaire development, psychometric assessment does not require the content validity ratio to be measured (28). The content validity of the questionnaire was determined based on the views of 10 experts. In doing so, the purposive sampling method was used. We also consulted 10 experts in the domain of spirituality, nursing management, and development of instrument at Shahid Beheshti University of Medical Sciences, Tehran University of Medical Sciences, Iran University of Medical Sciences, Tarbiat Modarres University, and Baqiatallah University of Medical Sciences, and used their constructive opinions.

The content validity index was calculated for each item as well as for the entire questionnaire using the CVI formula. The experts also examined the face validity of the Persian version of the questionnaire. The face validity determines whether or not the scale appears valid to the

subjects or other participants. In addition to the experts' views, the opinion of the respondents was also taken for determining the face validity (20). For this purpose, 10 nurses participating in the study were interviewed in person and the difficulty level of the phrases and inconsistencies or ambiguities were evaluated once again.

2.7. Construct Validity

A Confirmatory Factor Analysis (CFA) was performed in AMOS-18 to evaluate the construct validity of the Persian version of Fry's spiritual leadership questionnaire. The CFA is a method that offers a structural equations model used to determine the goodness of fit between a theoretical model and the data obtained from study subjects (29). There are many indices of goodness to decide about the goodness of a model and it is preferred to use several different indices (30). The goodness of fit indices used in this study included root mean square error of approximation (RMSEA), comparative fit index (CFI), normed fit index (NFI), and Incremental fit index (IFI).

2.8. Reliability

The next step after confirming the validity of the tool was to determine its reliability. The reliability of a questionnaire is an important criterion that demonstrates the quality of the tool and the precision or accuracy of the assessments it makes (20). The ICC is an index that estimates the degree of agreement between the scores of 2 or more assessments in measuring a quantitative variable.

The internal consistency method using Cronbach's alpha (20) and the ICC were used to determine the reliability of the questionnaire. For the test-retest, the questionnaire was completed by 30 eligible nurses with an interval of 2 weeks, as the recommended interval for test-retest is 2 to 3 weeks (20, 31).

2.9. Statistical Data Analysis

The SPSS 18 and LISREL 18 were used to determine the construct validity, reliability, and descriptive analysis of the instrument and to analyze the data for designing the SEM of Fry's spiritual leadership. The Kolmogorov-Smirnov test was accomplished to assess whether the continues variable were normally distributed. The Kolmogorov-Smirnov test has proved data normality. The analysis of the fit of the model under study was accomplished with SEM fitness indices. To establish the internal consistency of the inventory, Cronbach's α was used and to determine the correlation between the variables, Pearson's product-moment correlation coefficient was applied. One-way analysis of variance (ANOVA) and Sample t test were used to estimate significant differences among the demographic

variables ($P = 0.05$). Considering that only confirmatory factor analysis (CFA) was used to determine sample volumes, exploratory factor analysis (EFA) was not used simultaneously for the same sample volume; therefore, the split data method was not used. One-way ANOVA and sample t test indicated a significant difference between a number of demographic variables ($P < 0.001$).

3. Results

3.1. Sample Characteristics

The majority of the participants were female (75.5%) and in the age range was 25 to 40 (65.6%). The participants had a mean work experience of 10.43 ± 6.95 years. Table 1 presents some of the personal characteristics of the participants. One-way ANOVA and sample t test indicated a significant difference between a number of demographic variables ($P < 0.001$) (Table 2).

Table 1. The Frequency Distribution of the Demographic Characteristics of the Participant

Variable	Value
Gender	
Female	302 (75.5)
Male	98 (24.5)
Education degree	
Bachelor's degree	357 (89.25)
Master's degree	39 (9.75)
PhD	4 (1)
Marital status	
Married	228 (57)
Single	155 (38.75)
Other	17 (4.25)
Organizational status	
Nurse	328 (82)
Head nurse	22 (5.5)
Staff nurse	41 (10.25)
Supervisor	9 (2.25)
Age	
< 25	56 (14)
25 - 40	262 (65.5)
41 - 55	79 (19.75)
> 55	3 (0.75)

Table 2. The Relationship Between the Respondents' Characteristics and the Mean Score of the Factors (N = 400)

Variable	F (%)	Vision	Hope/Faith	Altruistic Love	Membership	Calling	Inner Life	Organizational Commitment	Productivity
Gender (n = 400)									
Female	302 (75.5)	3.44 ± 0.93	3.41 ± 0.93	2.51 ± 0.99	4.15 ± 0.87	2.78 ± 0.90	3.73 ± 0.66	2.92 ± 0.95	3.31 ± 0.95
Male	98 (24.5)	3.51 ± 0.99	3.48 ± 0.98	2.82 ± 0.86	3.99 ± 0.87	3.15 ± 0.91	3.73 ± 0.63	3.08 ± 0.96	3.35 ± 0.84
P value		0.485	0.511	0.005	0.116	0.000	0.981	0.156	0.639
Level of education degree									
Bachelor's degree	357 (89.25)	3.43 ± 0.89	3.38 ± 0.92	2.59 ± 1.02	4.19 ± 0.84	2.83 ± 0.94	3.72 ± 0.68	2.97 ± 1.00	3.32 ± 0.96
Master's degree	39 (9.75)	3.38 ± 0.99	3.40 ± 0.98	2.30 ± 0.82	4.14 ± 0.81	2.72 ± 0.96	3.93 ± 0.51	2.92 ± 0.99	3.29 ± 0.98
PhD	4 (1)	3.88 ± 0.83	3.88 ± 0.72	2.43 ± 1.29	4.67 ± 0.58	2.92 ± 1.7	3.98 ± 0.73	3.30 ± 1.59	3.06 ± 1.39
P value		0.584	0.561	0.225	0.576	0.775	0.125	0.761	0.856
Marital status									
Married	228 (57)	3.29 ± 0.89	3.31 ± 0.90	2.54 ± 1.02	4.13 ± 0.81	2.83 ± 0.92	3.66 ± 0.65	2.91 ± 0.93	3.27 ± 0.93
Single	155 (38.75)	3.57 ± 0.93	3.48 ± 0.96	2.62 ± 0.98	4.13 ± 0.89	2.85 ± 0.94	3.78 ± 0.66	3.02 ± 1.02	3.33 ± 0.95
Other	17 (4.25)	3.10 ± 1.23	3.60 ± 1.18	2.51 ± 0.78	3.49 ± 1.02	3.25 ± 0.71	3.58 ± 0.71	2.78 ± 0.95	3.39 ± 0.73
P value		0.005	0.168	0.731	0.009	0.182	0.131	0.363	0.761
Organizational status									
Nurse	328 (82)	3.39 ± 0.93	3.42 ± 0.94	2.61 ± 1.01	4.09 ± 0.88	2.85 ± 0.2	3.72 ± 0.67	2.93 ± 0.98	3.33 ± 0.95
Head nurse	22 (5.5)	3.39 ± 0.95	3.08 ± 0.91	2.28 ± 0.85	4.01 ± 0.93	2.58 ± 0.84	3.62 ± 0.64	2.69 ± 0.86	2.94 ± 0.93
Staff nurse	41 (10.25)	3.81 ± 0.93	3.55 ± 0.97	2.92 ± 0.89	4.12 ± 0.92	3.10 ± 0.93	3.85 ± 0.63	3.26 ± 0.97	3.68 ± 0.66
Supervisor	9 (2.25)	4.25 ± 0.67	4.25 ± 0.65	2.56 ± 1.02	4.86 ± 0.33	3.42 ± 1.03	4.22 ± 0.55	3.98 ± 0.65	3.64 ± 0.75
P value		0.009	0.005	0.079	0.067	0.031	0.072	0.001	0.008
Age									
< 25	56 (14)	3.48 ± 0.97	3.60 ± 0.90	2.76 ± 1.09	4.02 ± 0.92	2.97 ± 0.99	3.64 ± 0.67	2.90 ± 1.01	3.31 ± 0.93
25 - 40	262 (5.65)	3.39 ± 0.97	3.37 ± 0.99	2.55 ± 0.96	4.09 ± 0.85	2.82 ± 0.93	3.69 ± 0.68	2.94 ± 0.99	3.26 ± 0.96
41 - 55	79 (75.19)	3.62 ± 0.86	3.47 ± 0.89	2.58 ± 0.95	4.21 ± 0.92	2.92 ± 0.83	3.91 ± 0.52	3.06 ± 0.96	3.54 ± 0.77
> 55	3 (0.75)	3.50 ± 0.43	3.33 ± 0.58	2.13 ± 0.12	5.00	3.00 ± 0.43	4.40 ± 0.53	3.13 ± 0.23	3.42 ± 0.76
P value		0.317	0.378	0.434	0.171	0.600	0.01	0.736	0.134

3.2. Content Validity

In addition to adopting a qualitative approach, this study also measured the content validity indices of the questionnaire and reported their mean as 0.94 for relevance. Polit and Beck (2013) (20) proposed a content validity index of 0.9 or above as the standard value for content validity. For face validity, minor changes were made in some of the items of the questionnaire, according to the comments of the surveyed nurses and experts, therefore, no items were removed in the content validity assessment stage and all the items were entered for construct validity assessment. Table 4 presents the content validity indices and impact score of the items.

3.3. Construct Validity

The confirmatory factor analysis was used to confirm that all the 35 items fell into the 8 theoretically-determined factors. The chi-square index (χ^2) is affected by sample size and is increased in sample sizes above 200; as a result, many researchers measure the Chi-square to the degree of freedom, i.e. the relative chi-square (χ^2/df). The ratio of this index minimizes the effect of sample size on chi-

square (31). The χ^2/df was calculated as 2.68 in this study, which indicates a good fit.

An acceptable RMSEA is ≤ 0.1 , reported as 0.08 in this study, and IFI, CFI, and NFI should be ≥ 0.90 , reported as 0.95, 0.91, and 0.90 in this study; the values obtained in this study reveal a good confirmatory factor analysis (32). Since RMSEA values less than 0.1 indicate good fitness of the model and values less than 0.05 indicate excellent fitness of the model (33), the RMSEA value obtained in this study (0.8) was acceptable (Table 3).

The factor loading values ranged from 0.32 to 0.95 in this study, which are all more than 0.3 (the acceptable value) and therefore considered significant. The 35 items were thus confirmed within the 8 determined factors. Table 4 presents the details of all the items of the questionnaire.

There are various approaches to the investigation of construct validity of an instrument, one of which is the correlation between instruments and a variable on the basis of a fully-fledged theory. Although no correlation has been yet reported theoretically between “spiritual leadership and its categories” and “demographic variables”, this

Table 3. Results of Fit Index Confirmatory Factor Analysis of Fry's Spiritual Leadership Questionnaire (N = 400)^a

Model	χ^2	df	RMSEA	CFI	NFI	IFI
Value	1427.3	532	0.08	0.95	0.9	0.91

Abbreviations: CFA, Confirmatory Factor Analysis; CFI, Comparative Fit Index; df, Degree of Freedom; IFI, Incremental Fit Index; NFI, Normed Fit Index; RMSEA, Root Mean Square Error of Approximation; χ^2 , Chi-Square; χ^2/df , Normed Chi-Square.
^aAll item scale relationships were statistically significant $P < 0.001$.

study demonstrated a significant positive correlation ($P < 0.05$) between nurses' environment and official post ($r = 0.151$), love for altruism and gender ($r = 0.137$), employment status ($r = 0.172$), membership and gender ($r = 0.173$), inner life and age ($r = 0.145$), work experience ($r = 0.126$), and ultimately, between spiritual leadership and management experience ($r = 0.280$) and official post ($r = 0.103$). Tables 5 and 6 display the correlation matrix and coefficients of any variable of the measurement model.

3.4. Reliability of the Questionnaire

For the Intraclass Correlation Coefficient (ICC), the degree of agreement between the test-retest responses by ICC was 0.92 for the entire questionnaire and ranged from 0.74 for the categories 'faith/hope' and 'organizational commitment' to 0.86 for 'organizational productivity'. In addition, the internal consistency (Cronbach's alpha) was measured as 0.94 for the entire questionnaire and ranged from 0.71 for 'inner life' to 0.90 for 'love and altruism'. Table 4 presents these results.

Among the probable drawbacks of the measurements were ceiling effect and floor effect, which indicate the inability of the questionnaire in measuring the maximum and minimum states. These effects are proven when 15% of the points are acquired in the possible maximum or minimum limits (34). In this questionnaire, only the category of "productivity" obtained 0.75 points while the points of other categories was zero. Therefore, in the Persian version of the spiritual leadership questionnaire no ceiling effect and floor effect were observed.

4. Discussion

This study was conducted to assess the psychometric properties of Fry's spiritual leadership questionnaire and proposes it as a valid tool to be used for nursing research in Iran. Various psychometric properties were thus examined in the Iranian community of clinical nurses, including face validity, content validity, construct validity, and reliability.

The content validity index was used to assess the content validity of the questionnaire, which was calculated as 0.94 for the entire questionnaire and as > 0.79 for all the

items; therefore, the questionnaire content is a valid measure of the trait for which it was developed to assess.

Iranian researchers have so far used some parts of this questionnaire in line with their research objectives and tested models; for example, Allameh et al. (21) considered only the categories 'organizational vision', 'faith and hope' and 'altruism' as independent variables for Fry's spiritual leadership model and did not use 'membership' and 'calling' of the questionnaire. A study by Seyed Kavoosi and Nasersfahani (19) also neglected the categories 'organizational commitment' and 'organization productivity'; and as noted earlier, the category 'inner life' was eliminated from all the studies. As for the other categories of the questionnaire, no researchers have yet reported the tool's face and content validity (2, 10, 11, 19), except for Goudarzvand Chegini and Farjadi Nezhad (35), who sufficed to say that they had examined the content validity of the tool but did not report its content validity indices. In addition, none of these researchers discussed the tools' translation stages.

The factor loading values were between 0.32 and 0.95 in this study, which were all significant as they were above 0.3; therefore, no items were removed. A search was performed for Fry's studies, yet, did not find any studies reporting factor loading of items, which made comparison and analysis impossible. Other studies included the study of Khoshpanjeh et al. (36), which reported factor loading of items as 0.59 to 0.87 for the categories "vision, altruistic love, membership, organizational commitment, and productivity". Thus, in agreement with the present study, no item was discarded in their study. Seyed Kavoosi and Nasersfahani (19) reported factor loading of "vision, membership, altruistic love, and organizational commitment" of this questionnaire between 0.68 and 0.78. They did not report elimination of any of the items, either. In another study, Najafluye Torkamani et al. (11) reported elimination of 6 items due to factor loading of less than 0.12. The category of inner life from spiritual leadership questionnaire was not used in their study. In a study conducted by Jeon et al. (16) to test the spiritual leadership model using Fry's spiritual leadership questionnaire, the first item on inner life was removed to improve the measurement model fit due to its low factor loading.

The differences between data collected from nursing

Table 4. The Factor Loading, Internal Consistency Content Validity Index, Intraclass Correlation Coefficient, Item Content Validity Index (CVI), Factor CVI and Impact Score in the Persian Version of Fry's Spiritual Leadership Questionnaire^a

Construct	Factor Loading	Internal Consistency	Intraclass Correlation (ICC)	Item CVI, %	Factor CVI, %	Impact Score
Vision		0.89	0.76		97.5	
Q1	0.73			100		4.7
Q2	0.92			100		4.8
Q3	0.89			90		4.14
Q4	0.78			100		4.05
Hope/fith		0.86	0.74		90	
Q5	0.83			100		4.9
Q6	0.85			90		4.32
Q7	0.73			90		3.69
Q8	0.75			80		3.52
Altruistic love		0.90	0.83		100	
Q9	0.87			90		3.52
Q10	0.80			100		3.78
Q11	0.90			100		4.9
Q12	0.80			100		4.7
Q13	0.73			100		4.9
Calling		0.84	0.79	90	92.5	
Q14	0.54					3.28
Q15	0.83			100		4.8
Q16	0.95			90		3.42
Q17	0.79			80		4.05
Membership		0.77	0.79		100	
Q18	0.83			100		4.7
Q19	0.83			100		4.6
Q20	0.32			100		4.5
Q21	0.78			90		4.23
Inner life		0.71	0.76		82	
Q22	0.62			90		4.05
Q23	0.67			80		3.44
Q24	0.58			100		4.6
Q25	0.65			80		3.36
Q26	0.32			80		2.52
Organizational commitment		0.78	0.74		100	
Q27	0.73			100		4.9
Q28	0.72			100		4.9
Q29	0.86			100		4.8
Q30	0.82			100		4.7
Q31	0.90			100		4.8
Productivity		0.89	0.86		92.5	
Q32	0.79			100		4.6
Q33	0.82			100		4.9
Q34	0.62			100		4.9
Q35	0.55			90		4.14
Total		0.94	92	0.94		

Abbreviation: CVI, Content Validity Index.
^a P < 0.001.

community and industry, and also the fact that Iranian researchers in industry have not used all categories of this questionnaire should be taken into account in interpretation and comparison of data in this part of the study.

Psychometric study of spiritual leadership questionnaire in the nursing community in other countries including the United States, where this questionnaire was developed, can be helpful.

Table 5. Means, Standard Deviations, and Correlations between Variables

Variables	Spiritual leadership	1	2	3	4	5	6	7	8
Vision	0.72 ^a	-							
Hope/Faith	0.78 ^a	0.72 ^a	-						
Altruistic Love	0.80 ^a	0.52 ^a	0.58 ^a	-					
Calling	0.44 ^a	0.23 ^a	0.22 ^a	0.11 ^b	-				
Membership	0.79 ^a	0.46 ^a	0.56 ^a	0.75 ^a	0.16 ^a	-			
Inner life	0.69 ^a	0.34 ^a	0.47 ^a	0.40 ^a	0.47 ^a	0.48 ^a	-		
Organizational Commitment	0.83 ^a	0.49 ^a	0.57 ^a	0.66 ^a	0.33 ^a	0.63 ^a	0.53 ^a	-	
Productivity	0.62 ^a	0.35 ^a	0.35 ^a	0.41 ^a	0.19 ^a	0.43 ^a	0.42 ^a	0.43 ^a	-
Mean	3.29	3.45	3.43	2.60	4.11	2.87	3.72	2.97	3.32
SD	0.65	0.95	0.95	0.98	0.87	0.92	0.65	0.97	0.92

^a Correlation is significant at the 0.01 level (2-tailed).
^b Correlation is significant at the 0.05 level (2-tailed).

Table 6. The Regression Coefficients of Spiritual Leadership Variable

Variables	B	Std. Error	Standardized Coefficients (Beta)	t	Sig.	Tolerance	VIF
Constant	-0.004	0.003		-1.058	0.291		
Vision	0.115	0.001	0.169	144.673	0.000	0.452	2.213
Hope/Faith	0.116	0.001	0.169	132.500	0.000	0.376	2.658
Altruistic love	0.142	0.001	0.215	161.496	0.000	0.346	2.889
Calling	0.114	0.001	0.152	166.402	0.000	0.732	1.366
Membership	0.114	0.001	0.161	125.246	0.000	0.372	2.685
Inner life	0.142	0.001	0.143	131.682	0.000	0.523	1.912
Organizational commitment	0.141	0.001	0.212	175.911	0.000	0.424	2.361
Productivity	0.115	0.001	0.164	178.165	0.000	0.722	1.385
Dependent variable	Spiritual leadership			Adjusted R2		1.00	
				Durbin-Watson		1.874	
				F (Sig.)		0.000	

The ICCs calculated in this study were 0.92 for the entire questionnaire and 0.74 to 0.86 for the categories. In a 2011 study conducted by Fry et al. (26), the ICCs were calculated as 0.12 to 0.46 for the questionnaire. None of the studies conducted on Fry’s spiritual leadership questionnaire in Iran reported the ICC of the tool.

The reliability of the questionnaire was also calculated using the internal consistency method (Cronbach’s alpha), which was obtained as 0.94 for the entire questionnaire and as 0.71 to 0.90 for the categories. These correlations showed that the questionnaire and its categories had coefficients above 0.70; however, it should be noted that ‘inner life’ has a very close correlation with this value. In a 2016 study by Fry et al., the Cronbach’s alpha coefficients of the questionnaire categories were reported as 0.75 to 0.94 (1). In the study by Jeon et al. (16), the alpha coefficient of the questionnaire was obtained as 0.81 to 0.91, which is close to the coefficients obtained in this study. In the study by Hunsaker (18) in South Korea, the questionnaire categories had coefficients between 0.65 and 0.84, and the lowest value was related to ‘inner life’ in that study, as well. In studies

conducted in Iran, such as the one by Najafluye Torkamani et al. (11), the Cronbach’s alpha coefficients of the questionnaire categories ranged from 0.73 to 0.92. Seyed Kavooosi and Nasrsfahani (19) reported the alpha coefficient of the entire questionnaire as 0.87.

Similar to the present study, in other studies, the category of inner life compared to other categories of this questionnaire had the lowest value, which implies that although this category is considered as the source of spiritual leadership, it has not been conceptualized or adequately addressed in the cultural context of different organizations. As explained above, the category of “inner life” has not yet been used in studies conducted in Iran.

According to the results of the present study, it can be argued that Fry’s spiritual leadership questionnaire is a reliable, repeatable, and adequately consistent tool that can be trusted.

The findings of this study are important because this style of leadership has been recognized as one of the most effective leadership models in the past decade (1, 11, 14, 16, 17). Assessing the psychometric properties of Fry’s spiritual

leadership questionnaire helps managers and authorities measure spiritual leadership in their organizations, particularly in nursing, with the use of a valid and reliable tool that also allows them to identify the strengths and weaknesses of their management and recognize the opportunities and threats for adopting and developing spirituality in the leadership of their organizations.

4.1. Conclusion

The results of this study showed that the Persian version of Fry's spiritual leadership questionnaire has good validity and reliability, and its 8 categories were thus confirmed for use in the Iranian community of nurses. With its 35 items and 8 categories, this tool can be used in national health care organizations, especially in nursing, and given the importance of spirituality in the health care system, it can be a practical way for determining the extent and scope of the application of this new method of leadership in the holistic nursing profession.

4.2. Strengths and Limitations

One of the strengths of this study is the large sample size of 10 participants per item for confirmatory factor analysis.

Given the time constraints and the limited access to participants, the questionnaires were only distributed among the medical universities of Tehran; the researchers recommend that this study is to be conducted on a larger scale in Iran. In addition, this study was conducted among nurses working in hospitals, and sampling nurses working at other centers, such as educational and health care centers, which can help the better generalizability of the results.

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Footnotes

Authors' Contribution: Study concept and design: Parivash Jahandar, Mansoureh Zagheri Tafreshi, Maryam Rassouli, Foroozan Atashzadeh-Shoorideh, and Amir Kavousi; acquisition of data, Parivash Jahandar and Mansoureh Zagheri Tafreshi; analysis and interpretation of data, Parivash Jahandar, Mansoureh Zagheri Tafreshi, Maryam Rassouli, Foroozan Atashzadeh-Shoorideh, and Amir Kavousi;

drafting of the manuscript, Parivash Jahandar, Mansoureh Zagheri Tafreshi, and Amir Kavousi; critical revision of the manuscript for important intellectual content, Parivash Jahandar and Mansoureh Zagheri Tafreshi; statistical analysis, Amir Kavousi, Mansoureh Zagheri Tafreshi, and Parivash Jahandar; administrative, technical, and material support, Mansoureh Zagheri Tafreshi, Maryam Rassouli, Foroozan Atashzadeh-Shoorideh, and Amir Kavousi; study supervision, Mansoureh Zagheri Tafreshi

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