

Psychometric Properties of the Persian Spiritual Coping Strategies Scale in Hemodialysis Patients

**Mohsen Saffari, Harold G. Koenig,
Ghader Ghanizadeh, Amir H. Pakpour &
Donia R. Baldacchino**

Journal of Religion and Health

ISSN 0022-4197

J Relig Health

DOI 10.1007/s10943-013-9700-7



Your article is protected by copyright and all rights are held exclusively by Springer Science +Business Media New York. This e-offprint is for personal use only and shall not be self-archived in electronic repositories. If you wish to self-archive your work, please use the accepted author's version for posting to your own website or your institution's repository. You may further deposit the accepted author's version on a funder's repository at a funder's request, provided it is not made publicly available until 12 months after publication.

Psychometric Properties of the Persian Spiritual Coping Strategies Scale in Hemodialysis Patients

Mohsen Saffari · Harold G. Koenig · Ghader Ghanizadeh ·
Amir H. Pakpour · Donia R. Baldacchino

© Springer Science+Business Media New York 2013

Abstract Spiritual strategies may provide an effective way of coping with disease. This study sought to investigate the validity and reliability of the Persian version of the spiritual coping strategies (SCS) scale among Iranian hemodialysis patients. A convenience sample of 204 hemodialysis patients was recruited to participate in the study. A forward–backward translation method was used to produce the Persian version of the scale. Internal consistency was assessed by Cronbach's alpha and item–total score correlation. Two-week test–retest reliability was also assessed. The convergent and divergent validity of the scale was evaluated using the Duke University Religion Index and a visual analogue scale for health

M. Saffari (✉)

Religion and Medicine Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran
e-mail: saffari.ches@gmail.com; m.saffari@bmsu.ac.ir

M. Saffari

Health Education Department, School of Health, Baqiyatallah University of Medical Sciences, Tehran, Iran

H. G. Koenig

Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC, USA
e-mail: Harold.Koenig@duke.edu

H. G. Koenig

King Abdulaziz University, Jeddah, Saudi Arabia

G. Ghanizadeh

Department of Environmental Health, School of Health, Baqiyatallah University of Medical Sciences, Tehran, Iran
e-mail: Qanizadeh@yahoo.com

A. H. Pakpour

Qazvin Research Center for Social Determinants of Health, Qazvin University of Medical Sciences, Qazvin, Iran
e-mail: pakpour_amir@yahoo.com

D. R. Baldacchino

Faculty of Health Sciences, University of Malta, Msida, Malta
e-mail: donia.baldacchino@um.edu.mt

status. Exploratory and confirmatory factor analyses were used to assess the factor structure. Participants consisted of 113 males and 91 females (mean age 57.2 [SD = 9.7]). Cronbach's alpha was acceptable (0.87). We found two underlying factors similar to the original scale. The correlations between the study scales confirmed the convergent and divergent validity of the SCS. Confirmatory factor analysis showed a good fit to the data (GFI = 0.923, CFI = 0.948 and RMSEA = 0.068). The Persian version of the SCS has sound psychometric properties in Iranian hemodialysis patients. Future research should consider applying the scale to populations with other religious/cultural backgrounds.

Keywords Spirituality · Coping · Hemodialysis · Validity · Reliability

Introduction

End-stage renal disease (ESRD) is a life-threatening condition and a major problem in public health. According to a recent data, currently over 850,000 people suffer from ESRD in the USA (NIDDK 2012), and the incidence increases by 8 % annually in the world (WHO 2012). Although there is little information about profile of the ESRD within developing countries, the situation seems more severe. For example, a survey in India showed an incidence of 151 per million population of ESRD during 2002–2005 (Modi and Jha, 2006). The number of patients with ESRD in Iran between 2000 and 2006 increased by 130 % per year (Aghighi et al. 2009).

Most of the patients with ESRD received conservative treatment, that is, hemodialysis (HD) (WHO 2012). The procedure is frequent, time-consuming and often accompanied by unpleasant symptoms and complications that require much adjustment and coping (Weisbord et al. 2004). Overall, the health outcomes among these patients are significantly lower than healthy populations (Pakpour et al. 2010, 2011). Moreover, these patients have numerous co-morbidities such as diabetes and hypertension (NIDDK 2012; Weisbord et al. 2004) that may affect their general ability to function, further increasing the challenge of coping with their illness. The prevalence of psychological disorders such as depression or depressive symptoms is high in such patients (Battistello 2012; Bugarski et al. 2010). The mortality rate of the disease (estimated about 20 to 25 % every year) (Eli Friedman 2012) is another factor that can demoralize patients and worsen their coping with the illness. Therefore, there is a need for practical strategies to reinforce and encourage patients' coping resources to help them adjust to their disease.

Spirituality is an integral part of health and gives meaning to patients' lives (Hutch 2011). This may help many with chronic and life-threatening diseases by providing support and purpose in their lives to help them cope with their difficult situations (Thune-Boyle et al. 2012). Over the last decade, many studies have demonstrated the role of spiritual resources in improving health outcomes among a wide range of patients (Kalish 2012). However, there is limited research about the importance of spiritual coping in the lives of HD patients. Some research in this field has shown that the spiritual beliefs and experiences may enhance quality of life and psychological well-being among these patients (Kao et al. 2009; Tanyi and Werner 2003). Spirituality is also identified as a core component in palliative care (Amoah 2011). Thus, HD patients may be a suitable group in which to study spirituality as a coping resource. In addition, the literature has recognized that there are considerable unmet spiritual needs among patients with ESRD (Davison and Jhangri 2010).

Unfortunately, there is little evidence on spirituality among people with non-Christian religions. At present, there are over 1.6 billion Muslims around the world (Fustos 2011).

The majority of population in Iran are Muslim. Most believe that the God's will is involved in all their conditions and that there is meaning and purpose in all life situations (Haque 2004). Therefore, religious coping as a part of spirituality may help them to adapt to their illnesses.

Spirituality is a complex term that requires specific, reliable and valid instruments. There are several useful tools for assessing spiritual coping, but most of them are in English and developed for use in Christians (Charzynska 2012; Hawthorne et al. 2011). Moreover, psychometric properties of most of these scales in HD patients are unknown. Therefore, the aim of the study was to evaluate the validity and reliability of the Persian version of the spiritual coping strategies (SCS) among a sample of Muslim Iranian HD patients.

Materials and Methods

Design and Sample

This cross-sectional study was performed during June 2012. The participants were recruited using a convenience sample from 2 general hospitals located in Tehran, Iran. The number of participants was adequate for factor analysis (Hair 2010). Inclusion criteria were the following: age more than 20 years, being HD patient, Muslim religion, orientation to time and place, and able to understand and read Farsi (Persian). Illiterate patients and those with any significant cognitive disabilities were excluded. Twenty additional patients participated in a 2-week test-retest reliability analysis. The study was approved by the Institutional Review Board of the Baqiyatallah University of Medical Sciences. All patients included in the study provided written consent before participation.

Measures

The SCS is a self-administered questionnaire developed by Baldacchino and Buhagiar in 2003 (Baldacchino and Buhagiar 2003). The SCS contains 20 items arranged in two parts related to spirituality (religious and non-religious coping strategies). The first part (religious coping) consists of 9 items and asks about participant's attitude with regard to religion and belief in God. The second part (non-religious coping) includes 11 items that assess humanistic coping strategies related to self, others and nature. All items have a four-point response scale (from 0 or never used to 3 or often used). The total score is calculated by summing the scores of all items, ranging from 0 to 60. Higher scores indicate greater use of spiritual coping. A cutoff point for the scale has not been defined. The validity and reliability of the scale have been established in previous studies (Baldacchino and Buhagiar 2003; Hawthorne et al. 2011).

Duke University Religion Index (DUREL) was developed in English by Koenig et al. (1997). This is a 5-item questionnaire that consists of 3 parts. The first part is a one-item measure of organizational religiosity that assesses frequency of attendance at religious meetings. The second part includes a single question that assesses non-organizational or private religiosity. The last part includes 3 items assessing intrinsic religiosity, which assesses religious beliefs and experiences. The score of each part should be calculated separately, and computing a total score is not recommended. This scale is a well-known and widely used religiosity scale with strong psychometric properties across medical and community samples. The Persian version of DUREL was used in the study (Saffari et al. 2012).

A visual analogue scale (VAS) was used to collect data about current health status. This was a horizontal line that was graded from 0 (poor health) to 100 (excellent health). Such a measure has been used in many previous studies (Kimura et al. 2008; Parkin et al. 2004).

The patients' medical records were used to collect data on co-morbidity. Demographic data were also collected on age, sex, marital status, education level, employment and accommodation.

Translation and Cultural Adaptation

Following the guidelines suggested by Beaton et al. (2000), the translation and transcultural adaptation of the SCS was conducted. These guidelines are: 1. forward translation from initial language version (English) into target language (Persian) using two bilingual translators, proficient in both languages; 2. assessment of agreement between translations to resolve any potential disagreement; 3. backward translation of the SCS from Persian to English by two other translators independent of earlier translations; 4. session by expert review panel to reach a final agreement and consensus on the pilot version; and 5. pilot testing the scale in the population and evaluation of face and content validity of the newly developed scale. The cultural context of the target language is considered in this type of translation. In addition, the process of translation focuses on conceptual equivalence instead of reaching only linguistic equivalence. Because there were a few words or items in the original scale that were not appropriate to the Islam religion, the expert panel decided to replace them with those that were proper or modify them if needed before pilot testing. As a result, the item no. 19 "Receiving communion" was replaced by "Vowing to God and votive offering (nahr)"; to item no. 6 "using spiritual/religious objects/icons" were added ring, rosary, image of a holy person and sacred fabric; to item No. 10, examples of spiritual/religious text were added, that is, the Holy Quran and Dua book; and in item 15, church was replaced by mosque or hosseinieh. The Persian version of the scale (Pr-SCS) was then tested in 15 volunteer HD patients during their HD sessions. These patients underwent a cognitive debriefing to improve their understanding of the scale items.

Data Analysis

Acceptability was assessed using ceiling and floor effects and missing data for summary score. To assess internal consistency, we used Cronbach's alpha coefficient and item-total correlation (ITC). Estimate of an alpha value higher than 0.70 was considered proper. ITC between 0.30 and 0.50 is classified as moderate, and that higher than 0.50 is regarded as good. Principal component method with varimax rotation was selected to perform exploratory factor analysis (EFA) in order to reach the solution that shows both the best structure and the highest coherence. Appropriateness of the data for factor analysis was examined using Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. The KMO value ranged from 0 to 1, and values higher than 0.70 are acceptable. Bartlett's test of sphericity was considered to assess the multicollinearity. The significant value in the test demonstrates that a set of data does not create an identity and then is suitable for factor analysis. Following the Kaiser-Guttman rule, factors with an eigenvalue greater than 1 were extracted. To evaluate convergent validity, the association of the Pr-SCS with the DUREL domains was considered. Divergent or discriminative validity assessed the relationship between the Pr-SCS and the VAS. Correlation coefficients were calculated using Spearman's rho correlation test. The differences between sex, age group, education level, marital status, employment, accommodation, health status and co-morbidity were also

Table 1 Sample characteristics and discriminative validity of the SCS using demographic and health data (N = 204)

| | N (%) | Discriminative validity of SCS | |
|-----------------------------|------------|--------------------------------|--------------------------|
| | | Mean \pm SD | P value (<i>t</i> test) |
| Age group | | | |
| <60 | 129 (63.2) | 45.27 \pm 9.66 | 0.970 |
| \geq 60 | 75 (36.8) | 45.22 \pm 9.22 | |
| Gender | | | |
| Male | 113 (55.4) | 45.55 \pm 9.74 | 0.619 |
| Female | 91 (44.6) | 44.89 \pm 9.18 | |
| Marital status | | | |
| Single | 63 (30.9) | 42.96 \pm 8.81 | 0.017 |
| Married | 141 (69.1) | 46.28 \pm 9.62 | |
| Education level | | | |
| <6 years | 76 (37.3) | 44.51 \pm 8.99 | 0.388 |
| \geq 6 years | 128 (62.7) | 45.70 \pm 9.76 | |
| Occupation status | | | |
| Employed | 27 (13.2) | 47.66 \pm 9.07 | 0.145 |
| Unemployed | 177 (86.8) | 45.74 \pm 9.46 | |
| Accommodation | | | |
| Rural | 11 (5.4) | 55.09 \pm 2.38 | <0.001 |
| Urban | 193 (94.6) | 44.69 \pm 9.43 | |
| Self-reported health status | | | |
| <50 | 61 (29.9) | 43.78 \pm 8.96 | 0.024 |
| \geq 50 | 143 (70.1) | 47.03 \pm 9.71 | |
| Co-morbidity | | | |
| Yes | 184 (90.2) | 43.70 \pm 11.15 | 0.031 |
| No | 20 (9.8) | 46.32 \pm 9.31 | |

examined using student's *t* test. The findings of EFA were assessed using confirmatory factor analysis (CFA). The CFA was performed to evaluate fitness of the model with data. Some recommended goodness-of-fit indices are goodness-of-fit index (GFI), comparative fit index (CFI) and normed fit index (NFI) with a value more than 0.90, and root mean square error of approximation (RMSEA) with a value lower than 0.08 for reasonable fit (Jeremy 2009). A *P* value < 0.05 (2-tailed) was used to show significant results. SPSS for Windows, version 20 (IBM Corporation, Software Group, NY, USA), and analysis of moment structures (AMOS), version 20, were used to analyze the data.

Results

The sample included 204 eligible HD patients, 113 (55.4 %) males and 91 (44.6) females. The mean age of the participants was 57.24 \pm 9.70, and most of them (69.1 %) were married. The response rate of the participants was 92 %. We did not find any significant difference in total score of the Pr-SCS to variables such as age, sex, education level and

Table 2 Descriptive analysis of each item and item reliability of SCS

| Item (summarized) | Mean | Standard deviation | Corrected item–total correlation | Cronbach's α (if item deleted) |
|---|------|--------------------|----------------------------------|---------------------------------------|
| 1. Using personal/private prayer | 2.76 | 0.490 | 0.393 | 0.878 |
| 2. Relationship with God or higher power | 2.80 | 0.434 | 0.405 | 0.874 |
| 3. Relationship with friends or relatives | 2.46 | 0.796 | 0.374 | 0.874 |
| 4. Praying with someone else or a group | 2.02 | 0.950 | 0.406 | 0.874 |
| 5. Discussing problems with someone else | 2.07 | 0.937 | 0.352 | 0.878 |
| 6. Using spiritual/religious objects/icons | 2.19 | 0.911 | 0.377 | 0.875 |
| 7. Seeing the positive side of your situation | 2.29 | 0.893 | 0.736 | 0.861 |
| 8. Using radio or TV religious programs | 2.23 | 0.813 | 0.492 | 0.870 |
| 9. Hoping that the future will be brighter | 2.38 | 0.871 | 0.659 | 0.864 |
| 10. Hoping that the future will be brighter | 2.42 | 0.914 | 0.535 | 0.869 |
| 11. Accepting the current situation of life | 2.44 | 0.843 | 0.646 | 0.865 |
| 12. Finding meaning and purpose to live | 2.34 | 0.841 | 0.534 | 0.869 |
| 13. Appreciating the beauty of arts | 1.93 | 0.995 | 0.500 | 0.870 |
| 14. Confiding in relatives and friends | 2.35 | 0.872 | 0.446 | 0.872 |
| 15. Attending mosque or hosseinieh | 2.01 | 0.988 | 0.584 | 0.867 |
| 16. Using reflection to identify potentials | 2.13 | 0.976 | 0.538 | 0.869 |
| 17. Helping others to give love and peace | 2.33 | 0.734 | 0.558 | 0.869 |
| 18. Trusting in God, hoping that things will get better | 2.75 | 0.573 | 0.434 | 0.873 |
| 19. Vowing to God or votive offering | 2.08 | 0.921 | 0.476 | 0.871 |
| 20. Appreciating nature, for example, sea, sun | 2.21 | 0.846 | 0.450 | 0.872 |

employment (discriminative validity), but the differences of the score for variables such as marital status, accommodation, health status and co-morbidity were significant ($P < 0.05$) (See Table 1).

The overall Cronbach's alpha coefficient for all items was 0.87 and for sub scales ranged from 0.77 to 0.85. The correlation between item and total scale ranged from 0.35 to 0.73. The mean total score for the Pr-SCS was 45.25 ± 9.48 . The mean item scores ranged from 1.93 ± 0.99 to 2.80 ± 0.43 (Table 2). Test-retest reliability in a separate sample of 20 patients showed a 2-week interval kappa value of 0.88.

As shown in the Table 3, there were significant correlations between the total Pr-SCS and subscales of the DUREL (convergent validity). In addition, the religious subscale of the Pr-SCS showed high correlations with the subscales of the DUREL (convergent validity). The correlations between non-religious subscale of the Pr-SCS and the DUREL subscales were lower than those between religious subscale of the Pr-SCS and the DUREL subscales (divergent validity). There was not any significant correlation between Pr-SCS and VAS that indicates a good divergent validity (Table 3).

The KMO index had a value of 0.78 indicating that the sample was adequate for factor analysis. The Bartlett's test ($P < 0.001$) did not indicate any multicollinearity. The EFA produced a 2-factor solution that explained about 55 % of the variance. The first factor (non-religious coping) explained about 33.7 % of the variance, and the explained variance

Table 3 Correlation matrix of SCS's total and subscales with DUREL's subscales and VAS

| Scale | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------|------------------------------|---|---------|---------|---------|---------|---------|---------|
| SCS | 1. Total SCS | – | 0.839** | 0.920** | 0.452** | 0.468** | 0.305** | 0.088 |
| | 2. Religious coping | | – | 0.558** | 0.632** | 0.551** | 0.346** | 0.026 |
| | 3. Non-religious coping | | | – | 0.234** | 0.295** | 0.223** | 0.128 |
| DUREL | 4. Organized religiosity | | | | – | 0.304** | 0.171* | 0.167* |
| | 5. Non-organized religiosity | | | | | – | 0.265** | 0.073 |
| | 6. Intrinsic religiosity | | | | | | – | 0.205** |
| VAS | 7. Health status | | | | | | | – |

* Significant at the 0.05 level, ** significant at the 0.01 level

of the second factor (religious coping) was approximately 21 %. Loadings in the two factors were consistent with original factors.

Communalities that reflect the common or shared variance in the data structure were all higher than 0.40. Confirmatory factor analysis showed the two original introduced factors of the Pr-SCS should be retained (Table 4). The results demonstrated good indices of fit (GFI = 0.923, CFI = 0.948, NFI = 0.953 and RMSEA = 0.0068).

Table 4 Factor structure and factor loading of the SCS using the varimax rotation

| Item/factor | Original class ^a | Communalities/h ² | Component 1 | Component 2 |
|---------------------|-----------------------------|------------------------------|--------------|--------------|
| Q7 | NRC | 0.815 | 0.879 | 0.208 |
| Q9 | NRC | 0.779 | 0.857 | 0.212 |
| Q11 | NRC | 0.685 | 0.813 | 0.158 |
| Q12 | NRC | 0.692 | 0.798 | 0.235 |
| Q17 | NRC | 0.628 | 0.785 | 0.112 |
| Q16 | NRC | 0.632 | 0.755 | 0.250 |
| Q13 | NRC | 0.595 | 0.712 | 0.298 |
| Q20 | NRC | 0.466 | 0.658 | 0.183 |
| Q14 | NRC | 0.418 | 0.642 | 0.079 |
| Q3 | NRC | 0.416 | 0.615 | 0.196 |
| Q5 | NRC | 0.419 | 0.568 | 0.249 |
| Q15 | RC | 0.639 | 0.185 | 0.778 |
| Q10 | RC | 0.562 | 0.019 | 0.750 |
| Q8 | RC | 0.565 | 0.280 | 0.698 |
| Q18 | RC | 0.495 | 0.248 | 0.659 |
| Q15 | RC | 0.406 | 0.135 | 0.623 |
| Q1 | RC | 0.510 | 0.397 | 0.594 |
| Q2 | RC | 0.415 | 0.289 | 0.576 |
| Q4 | RC | 0.411 | 0.342 | 0.543 |
| Q19 | RC | 0.432 | 0.387 | 0.532 |
| Eigenvalue | | | 6.744 | 4.212 |
| % of variance | | | 33.72 | 21.06 |
| Cronbach's α | | | 0.851 | 0.774 |

^a NRC non-religious coping, RC religious coping

Values in bold indicate items comprising each component

Discussion

This study assessed the validity, reliability and factor structure of the Persian version of the SCS among a sample of hemodialysis patients. The results support the sound psychometric properties of the scale in the studied population.

The exploratory factor analysis showed that there are good correlations among the variables in the scale. Two factors were identified. The EFA is a good measure for distinguishing unfit items in a questionnaire. However, consistent with previous research, the EFA did not indicate any unfit items in the Pr-SCS. We used the most common type of rotation (Varimax) for extracting the factor loadings. This type of rotation helps to minimize the number of the items with high loadings on a related factor (Hair 2010) and also has been used in previous validation of the scale (Burrai et al. 2009). However, the factor structure of the scale was validated for the first time using an oblique rotation (Baldacchino and Buhagiar 2003).

Confirmatory factor analysis also indicated that our data fit the two original factors. All items were strongly correlated with the total score of the Pr-SCS. In addition, both total scale and its subscales indicate significant correlations with the subscales of the DUREL. Although the DUREL is not exactly a coping scale, there are relevant religious items in it that could be comparable to the religious coping part of the Pr-SCS (Koenig et al. 1997). In the initial psychometric evaluation of the SCS, the correlations of total score with subscale scores were performed using a more similar scale, that is, JAREL SWB (Hunglemann et al. 1985). Nevertheless, since there was not a more approximate scale in Persian, we used the DUREL to assess convergent validity.

The relatively higher correlation between the religious construct of the Pr-SCS and organized religiosity of the DUREL suggests that institutional religiosity among HD patient is a more significant coping strategy. The internal consistency of the scale with a total alpha of 0.87 indicates good homogeneity and reliability. This value is comparable with results from other studies of the scale that ranged from 0.73 to 0.88 (Baldacchino and Buhagiar 2003; Burrai et al. 2009; Hawthorne et al. 2011). The result of test–retest reliability also confirmed the stability of the scale over time.

An interesting finding of the study was that contrary to previous factor analyses of the scale (Baldacchino and Buhagiar 2003; Burrai et al. 2009), the non-religious coping factor loaded before religious coping. A reasonable explanation for this finding could be this fact that coping mechanisms among patients may be different from healthy peoples. All published results of SCS's psychometric properties in previous studies were performed on students or healthy samples. It seems that the use of non-religious coping may be higher than religious coping among HD patients. Although many studies reported that patients with life-threatening diseases use available religious resources to better cope with their illnesses (Kao et al. 2009; Tanyi and Werner 2003; Thune-Boyle et al. 2012), there is limited evidence about comparing application of religious and non-religious coping strategies concurrently. However, as Burkner et al. pointed out, religious and non-religious copings are independent elements of psychological well-being, and assessing both these styles of coping yields more information than surveying each one separately (Burkner et al. 2005).

Spiritual health as derived from ancient medicine is considered as an integration of body, mind and soul (Seidl 1993). We define strategies that use these elements to enhance the current health of the people as spiritual coping strategies. Therefore, we can expect that use of these strategies will help to improve health status. Studies indicate a positive role for religiosity and spirituality in the health status of HD patients (Kao et al. 2009; Ramirez

et al. 2012). In addition, the frequency of spiritual coping was significantly higher in those without medical co-morbidity than in patients with it, suggesting a relationship between spiritual coping and less co-morbidity. This should be investigated further in future research.

Married patients and patients from rural communities also had higher score of the SCS than others. Marital status has a noticeable impact on better coping with the diseases, and this is reported in the several studies (Ptacek et al. 2007; Renty and Roeyers 2007). Indeed, among patients who have a spouse, social support can facilitate better application of spiritual coping and can reinforce patient's spirits to better adjusting to the situation. Using spiritual resources has been reported in rural communities more than in urban communities (Gill et al. 2010). This may refer to the fact the rural people have stronger relationship with God and consider self-purification more than citizens.

In our study, adequate sample size was confirmed from results obtained. An appropriate index for addressing this issue is one assessing communalities (Ichikawa and Konishi 2008). In the present study, this index was higher than 0.40, indicating that sample size was adequate. In addition, the number of participants in the study met the recommended ratio of 10 respondents per item (Hair 2010).

A considerable strength of the current study was that no subjects were omitted from the analysis due to missing data. However, there are some limitations that should be regarded during interpretation of the findings. First, we used a convenience sampling that may reduce the possibility of generalization of the findings to other HD patients. However, the high response rate could have modified this limitation. Second, because there was not any other standard spiritual coping scale in Persian, we cannot evaluate the concurrent validity of the scale. We attempted to measure the related and un-related constructs of the scale and show the convergent and divergent validity. Construct validity was also confirmed by factor analysis.

Conclusion

In summary, the present study indicates that the Pr-SCS produces valid and reliable data on spiritual coping among HD patients. The psychometric properties of the scale are acceptable among such patients, similar to those obtained for the original scale. The use of this measure may help assess spiritual coping strategies and their relationships with health outcomes, especially in future studies. However, further studies in different cultural contexts are needed to confirm the scale's psychometric properties in other settings.

Acknowledgments The authors thank Baqiyatallah University of Medical Sciences for support to conduct the study. Also, we are grateful to Mr. Ali Karami and Mrs. Maryam Naderi for their valuable help to data collection.

References

- Aghighi, M., Mahdavi-Mazdeh, M., Zamyadi, M., Heidary Rouchi, A., Rajolani, H., & Nourozi, S. (2009). Changing epidemiology of end-stage renal disease in last 10 years in Iran. *Iranian Journal of Kidney Diseases*, 3(4), 192–196.
- Amoah, C. F. (2011). The central importance of spirituality in palliative care. *International Journal of Palliative Nursing*, 17(7), 353–358.

- Baldacchino, D. R., & Buhagiar, A. (2003). Psychometric evaluation of the Spiritual Coping Strategies scale in English, Maltese, back-translation and bilingual versions. *Journal of Advanced Nursing*, 42(6), 558–570.
- Battistello, M. (2012). Management of depression in hemodialysis patients. *Canadian Association of Nephrology Nurses and Technicians Journal* 22(3), 29–34; quiz 35–26.
- Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*, 25(24), 3186–3191.
- Bugariski, V., Sakac, V., Vodopivec, S., & Slankamenac, P. (2010). Relation between personality dimensions and depressive symptoms in patients on hemodialysis. *Medicinski Pregled*, 63(5–6), 305–312.
- Burker, E. J., Evon, D. M., Sedway, J. A., & Egan, T. (2005). Religious and non-religious coping in lung transplant candidates: Does adding God to the picture tell us more? *Journal of Behavioral Medicine*, 28(6), 513–526.
- Burrai, F., Scalorbi, S., Sebastiani, S., & Cenerelli, D. (2009). Psychometric analysis of the principal components of the Spiritual Coping Strategies. *Scenario*, 26, 13–20.
- Charzynska, E. (2012). Development of a questionnaire measuring spiritual coping. *Psychology and Health*, 27, 177–178.
- Davison, S. N., & Jhangri, G. S. (2010). Existential and supportive care needs among patients with chronic kidney disease. *Journal of Pain and Symptom Management*, 40(6), 838–843.
- Eli Friedman. (2012). A Comparison of ESRD Therapy in the United States and Overseas (An Editorial). Retrieved 2013-01-13, from The American Association of Kidney Patients (AAKP): <http://www.aakp.org/aakp-library/Comparison-ESRD-Therapy-United-States-Overseas/>.
- Fustos, K. (2011). The Global Muslim Population. Retrieved 2013-01-10, from Population Reference Bureau: <http://www.prb.org/Articles/2011/muslim-population-growth.aspx>.
- Gill, C. S., Minton, C. A. B., & Myers, J. E. (2010). Spirituality and religiosity: Factors affecting wellness among low-income, rural women. *Journal of Counseling and Development*, 88(3), 293–302.
- Hair, J. F. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Prentice Hall.
- Haque, A. (2004). Religion and mental health: The case of American Muslims. *Journal of Religion and Health*, 43(1), 45–58.
- Hawthorne, D., Youngblut, J. M., & Brooten, D. (2011). Psychometric evaluation of the Spanish and English versions of the spiritual coping strategies scale. *Journal of Nursing Measurement*, 19(1), 46–54.
- Hunglemann, J. A., Kenkel-Rossi, E., Klassen, L., & Stollenwerk, R. M. (1985). Spiritual well-being in older adults: Harmonious interconnectedness. *Journal of Religion and Health*, 24(2), 147–153.
- Hutch, R. A. (2011). Health and Healing: Spiritual, Pharmaceutical, and Mechanical Medicine. *Journal of Religion Health*.
- Ichikawa, M., & Konishi, S. (2008). Constructing second-order accurate confidence intervals for communalities in factor analysis. *British Journal of Mathematical and Statistical Psychology*, 61, 361–378.
- Jeremy J. (2009). Confirmatory Factor Analysis using Amos, LISREL, Mplus, SAS/STAT CALIS. Retrieved 2013-01-5, from Indiana University: <http://www.indiana.edu/~statmath>.
- Kalish, N. (2012). Evidence-based spiritual care: A literature review. *Current Opinion in Supportive and Palliative Care*, 6(2), 242–246.
- Kao, T. W., Chen, P. C., Hsieh, C. J., Chiang, H. W., Tsang, L. Y., Yang, I. F., et al. (2009). Correlations between spiritual beliefs and health-related quality of life of chronic hemodialysis patients in Taiwan. *Artificial Organs*, 33(7), 576–579.
- Kimura, T., Hayashida, K., Araki, Y., Morita, T., Yamaguchi, N., & Eboshida, A. (2008). How valid is the self-administered visual analogue scale for assessing the health status of elderly people? *Hiroshima Journal of Medical Sciences*, 57(3–4), 85–92.
- Koenig, H., Parkerson, G. R., Jr, & Meador, K. G. (1997). Religion index for psychiatric research. *American Journal of Psychiatry*, 154(6), 885–886.
- Modi, G. K., & Jha, V. (2006). The incidence of end-stage renal disease in India: A population-based study. *Kidney International*, 70(12), 2131–2133.
- NIDDK. (2012). Kidney Disease Statistics for the United States. Retrieved 2013-01-16, from National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK): <http://kidney.niddk.nih.gov/kudiseases/pubs/kustats/>.
- Pakpour, A. H., Saffari, M., Yekaninejad, M. S., Panahi, D., Harrison, A. P., & Molsted, S. (2010). Health-related quality of life in a sample of Iranian patients on hemodialysis. *Iranian Journal of Kidney Diseases*, 4(1), 50–59.
- Pakpour, A. H., Yekaninejad, M., Molsted, S., Harrison, A. P., Hashemi, F., & Saffari, M. (2011). Translation, cultural adaptation assessment, and both validity and reliability testing of the kidney disease quality of life—short form version 1.3 for use with Iranian patients. *Nephrology*, 16(1), 106–112.

- Parkin, D., Rice, N., Jacoby, A., & Doughty, J. (2004). Use of a visual analogue scale in a daily patient diary: modelling cross-sectional time-series data on health-related quality of life. *Social Science and Medicine*, *59*(2), 351–360.
- Ptacek, J. T., Pierce, G. R., & Ptacek, J. J. (2007). Coping, distress, and marital adjustment in couples with cancer: an examination of the personal and social context. *Journal of Psychosocial Oncology*, *25*(2), 37–58.
- Ramirez, S. P., Macedo, D. S., Sales, P. M. G., Figueiredo, S. M., Daher, E. F., Araujo, S. M., et al. (2012). The relationship between religious coping, psychological distress and quality of life in hemodialysis patients. *Journal of Psychosomatic Research*, *72*(2), 129–135.
- Renty, J., & Roeyers, H. (2007). Individual and marital adaptation in men with autism spectrum disorder and their spouses: The role of social support and coping strategies. *Journal of Autism and Developmental Disorders*, *37*(7), 1247–1255.
- Saffari, M., Zeidi, I. M., Pakpour, A. H., & Koenig, H. G. (2012). Psychometric Properties of the Persian Version of the Duke University Religion Index (DUREL): A Study on Muslims. *J Relig Health*.
- Seidl, L. G. (1993). The value of spiritual health. *Health Programme*, *74*(7), 48–50.
- Tanyi, R. A., & Werner, J. S. (2003). Adjustment, spirituality, and health in women on hemodialysis. *Clinical Nursing Research*, *12*(3), 229–245.
- Thune-Boyle, I. C., Stygall, J., Keshtgar, M. R., Davidson, T. I., & Newman, S. P. (2012). Religious/spiritual coping resources and their relationship with adjustment in patients newly diagnosed with breast cancer in the UK. *Psychooncology*.
- Weisbord, S. D., Fried, L. F., Arnold, R. M., Rotondi, A. J., Fine, M. J., Levenson, D. J., et al. (2004). Development of a symptom assessment instrument for chronic hemodialysis patients: The dialysis symptom index. *Journal of Pain and Symptom Management*, *27*(3), 226–240.
- WHO. (2012). How can we achieve global equity in provision of renal replacement therapy? Retrieved 2013-01-14, from World Health Organization: <http://www.who.int/bulletin/volumes/86/3/07-041715/en/>.