

Article

# Transcultural Adaptation and Psychometric Properties of Portuguese Version of the Spiritual Needs Questionnaire (SpNQ) Among HIV Positive Patients in Brazil

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Received: 28 February 2018; Accepted: 11 April 2018; Published: 18 April 2018



**Abstract:** The Spiritual Needs Questionnaire (SpNQ), originally written in the German language, was translated and validated into 11 languages, but not Latin languages, such as Brazilian Portuguese. This study aimed to determine the psychometric properties of the SpNQ after translation and transcultural adaptation to the Portuguese language, identifying unmet spiritual needs in a sample of patients living with HIV in Brazil. This pioneering study conformed a four-factor structure of 20 items, differentiating Religious Needs ( $\alpha = 0.887$ ), Giving/Generativity Needs ( $\alpha = 0.848$ ), Inner Peace ( $\alpha = 0.813$ ) and a new item: Family Support Needs ( $\alpha = 0.778$ ). The Brazilian version of the SpNQ (SpNQ-BR) had good internal validity criteria and can be used for research of the spiritual needs for Brazilian patients. The cross-cultural adaptation and comparison with previous studies showed that the SpNQ is sensitive to the cultural characteristics of different countries.

**Keywords:** psychometric properties; transcultural adaptation; spiritual needs; people living with HIV

## 1. Introduction

The World Health Organization defines a four-fold approach as a health concept to assess individual and community well-being that includes biological, psychological, social, and spiritual aspects (World Health Organization 1998). Among them, spirituality/religiosity has been deeply studied in the last decade and its positive effects on health are well established (Koenig 2015). Spirituality is defined as “dynamic and intrinsic aspect of humanity through which persons seek ultimate meaning, purpose, and transcendence, and experience relationship to self, family, others, community, society, nature, and the significant or sacred, expressed through beliefs, values, traditions, and practices” (Puchalski et al. 2014). A further, rather broad definition assumes “spirituality as all attempts to find meaning, purpose, and hope in relation to the sacred or significant (which may have a secular, religious, philosophical, humanist, or personal dimension)”, and the related “spiritual practices have commitment to values, beliefs, practices, or philosophies which may have an impact

on patients' cognition, emotion, and behavior" (Büssing et al. 2014). Although spirituality is often used as an opposite dimension to religiosity, "spirituality can be found through religious engagement", but also independent from specific religion "through an individual experience of the Divine, and/or through a connection to other people, the environment and the Sacred" (Büssing 2015).

Acquired immunodeficiency syndrome (AIDS) is one of the chronic diseases that most mobilizes human beings from a bio-psycho-socio-spiritual view. People with this disease often face isolation, anxiety, stress, depression, stigma and discrimination, characterizing a situation where subjective, supportive, and resilience need to be addressed in physical and mental healthcare (Tuck et al. 2001). Although AIDS has figured in the scientific literature since 1981, study on the importance given to spirituality by AIDS patients has been directed toward the role of spirituality/religiosity (S/R) on coping with their illness (Coleman et al. 2006; Kemppainen et al. 2006) or the disease in its final phase. Few studies have focused on the spiritual needs (Van Wyngaard 2013) of people living with HIV (PLHIV—seropositive patients who still do not show signs of disease progression), and none have been done in Brazil.

To help health services reflect the spiritual angle, several questionnaires have been proposed to check the relevance of S/R for chronic disease patients. The Spiritual Needs Questionnaire (SpNQ) is one of the most widely used. Originally written in the German language, by Büssing et al. (2009, 2010), this instrument can be used as a diagnostic instrument with 29 items and as a 20-item research instrument, which was validated in persons with chronic diseases, and also in (healthy) elderly and stressed people (Büssing et al. 2018). It avoids the exclusive use of religious terminology and is, thus, applicable also to persons living in secular societies and atheist/agnostic populations, relying on the bio-psycho-socio-spiritual or a "holistic" perspective of health. It has been translated into English, Italian, Polish, Danish, Chinese, Indonesian, Farsi, Croatian, and Lithuanian (Büssing et al. 2018), but not Latin languages, such as Brazilian Portuguese.

In this study, we aimed to identify spiritual needs in a sample of PLHIV in Brazil, translating SpNQ to the Portuguese Language and adapting it for cross-cultural purposes. It may highlight high-priority spiritual needs in a transdisciplinary perspective, contributing to a whole-person healthcare for these patients in Brazil.

## 2. Materials and Methods

### 2.1. Participants

The cross-sectional, longitudinal validation study included application of the SpNQ-BR and a demographic information questionnaire (including age, educational status, gender and religious organizational or non-organizational practices) for 200 seropositive patients, randomly selected among patients who followed up at the AIDS Outpatient Clinic of the Medical School Hospital, located in Rio de Janeiro, Brazil. This hospital is accredited as a National Aids Reference Center by the Brazilian Ministry of Health and it is the largest clinic with this specialty in Rio de Janeiro State. The inclusion criteria was to be older than or equal to 18 years of age, of all genders, HIV positive followed at Rio de Janeiro Federal State University Medical School HIV/AIDS Outpatient Clinic, to have the capacity to read, understand, fill out the instrument at the time of application. Patients with some level of clinical disorientation, unable to read, to understand, and to fill out the instrument, or those who refuse to sign the informed consent form were excluded. All participants were informed about confidentiality assurance and the purpose of the study and freely signed the informed consent form, consented to participate.

The study was carried out according to ethical principles in research and was approved by the Rio de Janeiro Federal State University (UNIRIO) Ethics Committee on Research in Human Beings (2.316.525/2017).

## 2.2. Questionnaire and Translation Process

To measure patients' spiritual needs, we used the Spiritual Needs Questionnaire (SpNQ) (Büssing et al. 2010, 2012). In its primary version, it differentiates between four main factors:

1. Religious Needs (Cronbach's alpha = 0.92), e.g., praying for and with others, praying alone, participating in a religious ceremony, reading spiritual/religious books, turning to a higher presence (e.g., God, angels);
2. Existential Needs (Reflection/Meaning) (alpha = 0.82), e.g., reflecting on one's life, talking with someone about the meaning of life/suffering, resolving open aspects in life, talking about the possibility of life after death, etc.;
3. Need for Inner Peace (alpha = 0.82), e.g., wish to dwell in places of quietness and peace, plunge into the beauty of nature, finding inner peace, talking with others about fears and worries, turning to someone in a loving attitude;
4. Need for Active Giving/Generativity (alpha = 0.74), e.g., active and autonomous intention to provide solace to someone, passing along one's own life experiences to others, and to be assured that life was meaningful and of value.

All items were scored with respect to self-ascribed importance on a 4-point scale from disagreement to agreement (0—not at all; 1—somewhat; 2—very; 3—extremely). For all analyses, we used the mean scores of the respective scales described above; the higher the scores, the stronger the respective needs were.

Translation and validation of the questionnaire was performed using the World Health Organization recommendations for the translation and adaptation of instruments (WHO 2014). After reading other papers about SpNQ transcultural adaptation, we asked the author for authorization, and the transcultural translation procedure followed the steps described below:

Step 1:

Translation of the 27-item English version into Portuguese by two bilingual professionals, aware of the objectives of the study, resulting in two Portuguese versions of SpNQ.

Step 2:

The versions were compared by another bilingual researcher, resulting in a reconciled version in Portuguese.

Step 3:

The reconciled version was translated back into English by two other bilingual professionals, and the versions were compared by another bilingual researcher, resulting in an SpNQ reconciled version in English.

Step 4:

The English and Portuguese versions were sent to the author of the instrument for review and approval.

Step 5:

The final version was approved by the author and was revised for Portuguese grammar, punctuation and formatting, obtaining a translated version of SpNQ for the pre-test.

Step 6:

The translated instrument was presented to 26 outpatients in 4 Brazilian health services, and individual interviews were conducted with each of them to identify problems in understanding the instrument's questions, obtaining the 27-item SpNQ Portuguese final version (27 SpNQ-BR).

## 2.3. Statistical Analyses

Descriptive statistics, internal consistency (Cronbach's coefficient  $\alpha$ ) and factor analyses (principal component analysis using Varimax rotation with Kaiser's normalization), as well as first order correlations, were computed using SPSS 21.0 and 23.0.

### 3. Results

#### 3.1. Participants

Data were collected in July, 2017. In the studied population, most were male (57%), with age ranging from 30–49 years old (57%) and 61% had a high school level education. Spiritists and religious organizational practices were the majority in the religious aspect (27%), as shown on Table 1.

**Table 1.** Demographic characteristics and religion of HIV positive Brazilian participants ( $N = 200$ ).

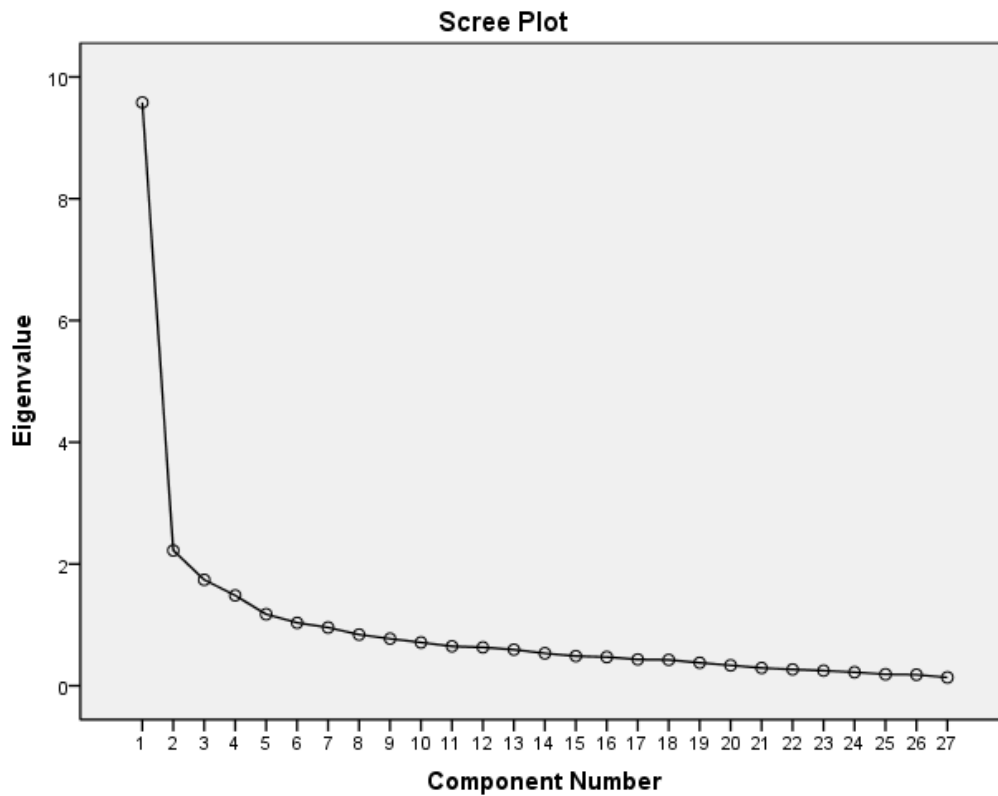
| Participants Characteristics  | N   | %    |
|---|-----|------|
| GENDER  |     |      |
| Male  | 114 | 57   |
| Female  | 82  | 41   |
| Other   | 4   | 2    |
| AGE   |     |      |
| Less than 29 year   | 60  | 30   |
| 30–49 year  | 114 | 57   |
| 50–70 year  | 26  | 13   |
| EDUCATIONAL STATUS  |     |      |
| Primary School Complete   | 6   | 3    |
| High School Incomplete  | 67  | 33.5 |
| High School Graduate  | 54  | 27   |
| University Incomplete   | 49  | 24.5 |
| Missing Values  | 24  | 12   |
| RELIGION  |     |      |
| Christian   | 46  | 23   |
| Kardecist Spiritist   | 54  | 27   |
| Other (Jewish, Ecumenic, Seicho-no-iê,<br>Hare-Krishna, Adventist of the Seventh-day,<br>White Table Rituals, Wicca, Buddhist,<br>Messianic, Jehovah's Witness) | 17  | 8.5  |
| Prefer not to say/missing values  | 83  | 41.5 |
| PRACTICE OF RELIGION  |     |      |
| Organizational  | 116 | 58   |
| No-organizational   | 43  | 21.5 |
| Missing values  | 41  | 20.5 |

#### 3.2. Validation of the Questionnaire

With KMO indexes = 0.89 and Bartlett's sphericity test,  $X^2(351) = 2775.405$ ,  $p < 0.001$  the item pool was suited for factor analysis. Together, they showed the association between items, which corroborated the factorial validity of the instrument and allowed us to continue analyses. The second step was the factorial analysis, fixing the number of factors to 4, as noted by Büssing et al. (2009). To do so, we used the method for main components, with orthogonal rotation types. It is important to point out that, in fact, this solution presented the best statistical parameters, compared with other alternatives (example: Trifactorial, bifactorial, or unifactorial). The quadrifactorial structure obtained values (eigenvalues) of 9.58; 2.22; 1.74 and 1.48 (shown in Figure 1), explaining 55.6% of the total variance.

Thus, the Portuguese version of the SpNQ (SpNQ-BR) included 20 items and differentiated four factors. The first factor was composed of seven items, accounting for 18.5% of the explained variance and with an eigenvalue of 9.58. From its semantic content, it was named "Religious Needs", and obtained loads between 0.52 and 0.83 factorials. The second factor was comprised of six items, explaining 14.9% of the variance, with an eigenvalue of 2.22 and factorial loads ranging from 0.51 to 0.69, and was called "Giving/Generativity Needs". The third factor was labeled "Inner Peace",

and was composed of three items, explaining 11.6% of variance, with an eigenvalue of 1.74 and factorial loads ranging from 0.79 to 0.83. Finally, the fourth factor, named “Family Support Needs”, contained three items which were intended as additional ‘psychosocial’ items of the SpNQ, and explained 10.5% of the variance, showed a 1.48 eigenvalue and factorial loads between 0.64 and 0.72. The factorial structure obtained can be seen in Table 2.



**Figure 1.** Graphical distribution of eigen values of Spiritual Needs Questionnaire —Portuguese Version (SpNQ-BR).

**Table 2.** Factorial structure, means, standard deviations, correlation items and factorial loads of the 20 Spiritual Needs Questionnaire Portuguese Version (SpNQ-BR) in a four-factors structure.

| Factors and Items                                      | Mean   | SD   | Correlation Item-Total | Alfa if Item Deleted | Factorial Loads |       |       |       |
|--|--|------|------------------------|----------------------|-----------------|-------|-------|-------|
|  |  |      |                        |                      | I               | II    | III   | IV    |
| 1—Religious Needs (eigenvalue 9.58; $\alpha = 0.887$ ) |  |      |                        |                      |                 |       |       |       |
| N21  | Participate at a religious ceremony (e.g., service)              | 0.95 | 0.98                   | 0.569                | 0.925           | 0.836 |       |       |
| N23  | Turn to a higher presence (e.g., God, Allah)                     | 1.36 | 1.00                   | 0.656                | 0.923           | 0.836 |       |       |
| N19  | Someone prays for you  | 1.08 | 0.94                   | 0.666                | 0.923           | 0.786 |       |       |
| N20  | Pray for yourself  | 0.94 | 0.91                   | 0.685                | 0.923           | 0.778 |       |       |
| N18  | Pray with someone  | 0.62 | 0.81                   | 0.656                | 0.924           | 0.639 | 0.335 | 0.330 |
| N03  | Someone of your religious community (e.g., pastor) cares for you | 0.39 | 0.67                   | 0.430                | 0.927           | 0.564 |       | 0.379 |
| N22  | Read religious/spiritual books                                   | 0.63 | 0.89                   | 0.545                | 0.925           | 0.523 | 0.519 |       |

Table 2. Cont.

| Factors and Items  |  | Mean | SD   | Correlation Item-Total | Alfa if Item Deleted | Factorial Loads |       |       |       |
|--|--|------|------|------------------------|----------------------|-----------------|-------|-------|-------|
|  |  |      |      |                        |                      | I               | II    | III   | IV    |
| 2—Giving/Generativity Needs (eigenvalue 2.22; $\alpha = 0.848$ ) |  |      |      |                        |                      |                 |       |       |       |
| N10  | Find meaning in illness and/or suffering       | 0.60 | 0.85 | 0.540                  | 0.925                |                 | 0.692 |       |       |
| N11  | Talk about the question of meaning in life     | 1.07 | 0.90 | 0.657                  | 0.923                | 0.377           | 0.617 |       |       |
| N13  | Turn to someone in a loving attitude           | 1.18 | 0.77 | 0.632                  | 0.924                | 0.333           | 0.601 |       |       |
| N12  | Talk about the possibility of life after death | 0.75 | 0.97 | 0.559                  | 0.925                | 0.438           | 0.595 |       |       |
| N17  | Be forgiven                                    | 1.08 | 0.98 | 0.554                  | 0.925                |                 | 0.551 |       |       |
| N14  | Give away something from yourself              | 0.98 | 0.82 |                        |                      |                 | 0.510 |       | 0.323 |
| 3—Inner Peace (eigenvalue 1.74; $\alpha = 0.813$ )               |  |      |      |                        |                      |                 |       |       |       |
| N07  | Dwell at a place of quietness and peace        | 1.78 | 0.77 | 0.501                  | 0.926                |                 |       | 0.837 |       |
| N08  | Find inner peace                               | 1.86 | 0.80 | 0.546                  | 0.925                |                 |       | 0.835 |       |
| N06  | Plunge into beauty of nature                   | 1.63 | 0.80 | 0.489                  | 0.926                |                 |       | 0.792 |       |
| N04  | Reflect your previous life                     | 0.99 | 0.86 | 0.440                  | 0.927                |                 | 0.387 | 0.469 |       |
| 4—Family Support Needs (eigenvalue 1.48; $\alpha = 0.778$ )      |  |      |      |                        |                      |                 |       |       |       |
| N30  | Receive more support from your family          | 1.09 | 0.73 | 0.543                  | 0.925                |                 |       | 0.302 | 0.722 |
| N25  | Feel connected with your family                | 1.14 | 0.74 | 0.537                  | 0.925                |                 |       |       | 0.665 |
| N28  | Be inserted again on your family concerns      | 0.38 | 0.68 | 0.418                  | 0.927                |                 | 0.325 |       | 0.649 |

A solution of five factors (supposing Family Support Needs to be an additional dimension), Varimax rotation, and main axis extraction (Valente et al. 2018) was also considered. However, it was not observed to be statistically well grounded: Giving/Generativity Needs consisted, on this solution, of only two items, as can be seen in Table 3. Also on this statistical version many items (N27, N24, N02, N14, N15, N04, and N05) would have to be excluded making five factors version use inappropriate.

Table 3. Factorial structure, means and standard deviations of the SpNQ—Portuguese Version in a structure of five factors.

| Factors and Items                                      |   | Mean | SD   | Correlation Item-Total | Alfa if Item Deleted | Factorial Loads |    |     |    |
|--|---|------|------|------------------------|----------------------|-----------------|----|-----|----|
|  |   |      |      |                        |                      | I               | II | III | IV |
| 1—Religious Needs (eigenvalue 9.58; $\alpha = 0.892$ ) |   |      |      |                        |                      |                 |    |     |    |
| N23  | Turn to a higher presence (i.e., God, Allah)        | 1.36 | 1.00 | 0.680                  | 0.908                | <b>0.809</b>    |    |     |    |
| N21  | Participate at a religious ceremony (e.g., service) | 0.95 | 0.98 | 0.594                  | 0.910                | <b>0.780</b>    |    |     |    |
| N19  | Someone prays for you                               | 1.08 | 0.94 | 0.686                  | 0.908                | <b>0.767</b>    |    |     |    |
| N20  | Pray for yourself                                   | 0.94 | 0.91 | 0.699                  | 0.908                | <b>0.749</b>    |    |     |    |
| N18  | Pray with someone                                   | 0.62 | 0.81 | 0.668                  | 0.909                | <b>0.594</b>    |    |     |    |
| N03  | Someone of your religious community cares for you   | 0.39 | 0.67 | 0.453                  | 0.913                | <b>0.513</b>    |    |     |    |

Table 3. Cont.

| Factors and Items   |   | Mean | SD   | Correlation<br>Item-Total | Alfa if Item<br>Deleted | Factorial Loads |              |              |              |
|---|---|------|------|---------------------------|-------------------------|-----------------|--------------|--------------|--------------|
|   |   |      |      |                           |                         | I               | II           | III          | IV           |
| <b>2—Existential Needs</b> (eigenvalue 2.22; $\alpha = 0.834$ )         |   |      |      |                           |                         |                 |              |              |              |
| N12   | Talk about the possibility of life after death          | 0.75 | 0.97 | 0.556                     |                         | <b>0.693</b>    |              |              |              |
| N11   | Talk with someone about the question of meaning in life | 1.07 | 0.90 | 0.640                     |                         | <b>0.568</b>    |              |              |              |
| N22   | Read religious/spiritual books                          | 0.63 | 0.89 | 0.551                     |                         | <b>0.567</b>    |              |              |              |
| N10   | Find meaning in illness and/or suffering                | 0.60 | 0.85 | 0.522                     |                         | <b>0.547</b>    |              |              |              |
| N13   | Turn to someone in a loving attitude                    | 1.18 | 0.77 | 0.610                     |                         | <b>0.527</b>    |              |              |              |
| N26   | Pass own life experiences to others                     | 1.00 | 0.81 | 0.673                     |                         | <b>0.415</b>    |              |              |              |
| <b>3—Inner Peace</b> (eigenvalue 1.74; $\alpha = 0.876$ )               |   |      |      |                           |                         |                 |              |              |              |
| N08   | Find inner peace  | 1.86 | 0.80 | 0.515                     |                         |                 | <b>0.819</b> |              |              |
| N07   | Dwell at a place of quietness and peace                 | 1.78 | 0.77 | 0.484                     |                         |                 | <b>0.813</b> |              |              |
| N06   | Plunge into the beauty of nature                        | 1.63 | 0.80 | 0.485                     |                         |                 | <b>0.727</b> |              |              |
| <b>4—Family Support Needs</b> (eigenvalue 1.48; $\alpha = 0.778$ )      |   |      |      |                           |                         |                 |              |              |              |
| N30   | Receive more support from your family                   | 1.00 | 0.75 | 0.526                     |                         |                 |              | <b>0.815</b> |              |
| N25   | Feel connected with your family                         | 1.14 | 0.74 | 0.525                     |                         |                 |              | <b>0.682</b> |              |
| N28   | Be inserted again on your family concerns               | 0.38 | 0.68 | 0.401                     |                         |                 |              | <b>0.538</b> |              |
| <b>5—Giving/Generativity Needs</b> (eigenvalue 1.17; $\alpha = 0.821$ ) |   |      |      |                           |                         |                 |              |              |              |
| N16   | Forgive someone from a distinct period of your life     | 0.95 | 0.92 | 0.482                     | 0.913                   |                 |              |              | <b>0.759</b> |
| N17   | Be forgiven   | 1.08 | 0.98 | 0.545                     | 0.912                   |                 |              |              | <b>0.736</b> |

#### 4. Discussion

Spirituality is one of the aspects that differentiates human beings from other creatures, and a way to highlight differences among societies and individuals. In Brazil, we do not have data regarding PLHIV spiritual needs, as such, this is a pioneering study.

The SpNQ was originally written in German by Büssing et al. (2010, 2012), and included 29 items that are not all used for the construct (19 items were used for the research instrument). In the Polish language (Büssing et al. 2015) 20 items were tested and two items were deleted during the factorial analyses (item N4W and N6W). The Chinese version (Büssing et al. 2013) was tested with 20 items, resulting in 17 items due to a weak factor loading of N2, N11, and N14. The Polynesian version (Nuraeni et al. 2015) tested 19 items and for the Iranian and New Zealand English Languages translation there is no information about the tested items (Nejat et al. 2016); however, all these translations processes included the four-factor structure: Religious Needs, Existential Needs, Inner Peace Needs, and Giving/Generativity Needs. In the Croatian Language translation process (Glavas et al. 2017) version 20 + 3 items was used to calculate the five factor scales, and, as an additional “non-spiritual” category, Social Support Needs (which is like our Family Support Needs scale). For the Persian version, the 19-item version was tested, and the five factors were tested and approved.

Nevertheless, there was stability of the four main factors with some variances, because some 'existential' items could be also be called 'inner peace' items, and vice versa. However, one has to take into account cultural and religious differences, because spirituality is a highly diverse set of beliefs, attitudes, and practices, and probably also needs. Moreover, the validation process of an interculturally-used instrument requires larger and more heterogeneous samples. This is also true for our sample of HIV positive patients, with 42% of them not stating their religious/spiritual orientation.

The diversity of translated versions caused a great deal of doubt in choosing the model to be tested in Brazil. Due to this, in the pilot test, we applied the SpNQ—27-item version to 26 in-patients with other diseases, using a five factor scale: Religious Needs, Existential Needs, Inner Peace Needs, Giving/Generativity Needs, and adding a category called Family Support Needs, which included questions regarding: Feeling connected with family, transmitting one's own life experiences to others, being assured that your life was meaningful and of value, being rather involved by your family in their life concerns, and receiving more support from your family. These questions were present in former SpNQ versions. In that pilot test, Family Support Needs was the most important domain to the interviewed Brazilian patients (Büssing et al. 2016).

Family Support Needs was also found to be relevant in the Brazilian PLHIV sample, confirming the former pilot test results; this was different from other countries, where SpNQ was previously translated (Büssing et al. 2018; Glavas et al. 2017; Hatamipour et al. 2018; Offenbaecher et al. 2013), where these items were used only as 'informative' items because of their lack of a 'spiritual' connotation. Data about the spiritual needs of PLHIV in other countries were not found, making it impossible to compare data.

This fact, and the way in which spiritual needs are linked to religious needs in the researched Brazilian population, is probably linked to the cultural characteristics of the Brazilian people, who are markedly religious, so that it is reflected in their everyday lives, in the capacity of expression of multiple forms of religious faith. These cultural and religious beliefs account for a fundamental part of the ethos of Brazilian culture and are often confused with spirituality (De Andrade 2009).

These results reinforce the need to have a spiritual needs measure that, not only can be translated into several languages, but also fits the cultural characteristics of each country, allowing comparison of the obtained results. SpNQ has promising characteristics to be a measure that strengthens efforts that are being done to broaden the integration of spiritual care as an essential aspect of person-centered healthcare in many countries, as proposed by the Global Network for Spirituality and Health (Puchalski et al. 2016).

The main limitation of this study is the rather small and young sample, as well as its exclusive focus on persons living with HIV. Therefore, further studies that enroll other persons from Brazil with chronic diseases are needed. With a more heterogeneous sample, the factorial structure may change slightly. The current validation process of the 20-item version (Büssing et al. 2018), enrolling healthy elderly and persons with chronic diseases showed that some items have a distinct relevance to persons with different life and health.

## 5. Conclusions

The translation of SpNQ showed that this measure had good internal validity and that its 20-item version can be used for research on the spiritual needs of Brazilian patients.

Cross-cultural adaptation and comparison with previous studies showed that the SpNQ can be adjusted to the cultural characteristics of different countries, especially regarding to the role and importance that societies give to religion and spirituality, remembering that the results of modifications to be proposed will certainly be influenced by the disease, the size of the sample to be researched and the study design.

We encourage subsequent studies regarding the theme in the largest Brazilian populations and in other Latin countries to confirm the results of this research.



**Acknowledgments:** No sources of funding are reported. We sincerely are grateful to Büssing who helped in the translation process and presented our work at the international meetings. We are very grateful to the undergraduate students, especially Anderson Tarocco Junior, that collaborated in the SpNQ translation and pilot test and Thiago Falheiros, undergraduate social sciences student that did the data collection

**Author Contributions:** Tania C. O. Valente and Ana Paula R. Cavalcanti conceived and designed the study. Rogerio N. Motta conducted data collection. Tania C. O. Valente, Ana Paula Cavalcanti, Clovis P. Costa Junior and Arndt Büssing analyzed the data. Tania C. O. Valente, Ana Paula R. Cavalcanti and Arndt Büssing wrote and revised the paper.

**Conflicts of Interest:** The authors declare no conflicts of interest.

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