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Original Article

Reliability and validity of the Chinese version of spiritual needs questionnaire with 27 items (SpNQ-Ch-27) in cancer patients

Yue Zhao^a, Yan Wang^{a,*}, Xiaoyue Yao^a, Ling Jiang^b, Ming Hou^c, Qing Zhao^c^a Department of Nursing, School of Medicine, Shihezi University, Shihezi, 832002, China^b First Hospital of Shihezi University School of Medicine, Shihezi, 832002, China^c People's Hospital of Xinjiang Uygur Autonomous Region, Urumchi, 830001, China

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ABSTRACT

Objective: To evaluate the reliability and validity of the Chinese version of the Spiritual Needs Questionnaire with 27 items (SpNQ-Ch-27) for cancer patients.**Methods:** A total of 457 cancer patients in a tertiary hospital in Xinjiang from March to July in 2017 were investigated by using the SpNQ-Ch-27 and convenient sampling method. They were recruited to validate the discrimination, reliability, and validity of the scale. According to the odd and even questionnaire numbers, data were divided into two groups to do exploratory factor analysis group and confirmatory factor analysis, respectively.**Results:** SpNQ-Ch-27 included 27 items and six factors, which were extracted by using factor analysis. It could explain 63.08% of the total variance. The total scores of each dimension and the SpNQ-Ch-27 were highly correlated, and the correlation coefficient was from 0.58 to 0.78. For the CFA, the overall fitting ideal was $\chi^2/df = 2.00$, RMSEA = 0.07, IFI = 0.93, NFI = 0.86, CFI = 0.92, TLI = 0.90; Cronbach's $\alpha = 0.90$; the dimensions of Cronbach's $\alpha = 0.63$ –0.95; split-half reliability was 0.82, dimensions were 0.68–0.95. **Conclusion:** SpNQ-Ch-27 is applicable for Chinese cancer patients with better validity and higher internal consistency, and it can be used as a tool to assess the spiritual needs of cancer patients.© 2019 Chinese Nursing Association. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Spiritual needs are the needs and expectations of a person to find life goals, commitment, and values whether or not he/she has religious beliefs [1]. If health care workers and social workers promptly pay attention to the spiritual needs of patients in time, they can offer better care for the patients at all levels, facilitate patients in achieving harmony, mind, and spirit, and affirm the value and significance of life [2]. At the same time, health care workers and social workers can improve the satisfaction of holistic nursing care by intervening in patients' spiritual needs [3].

The spiritual needs of cancer patients reportedly differ from patients with other diseases [4]. All dimensions of the spiritual needs of cancer patients in Germany were higher than those of other chronic diseases [5]. Cancer is a special branch of disease, with cancer patients confronting the following problems: physical

problems (i.e., physical impairment, fatigue, sleep disturbance, and side effects of treatment); psychological and social needs (i.e., emotional distress, depression, loss of sense of control, altered body image, and impaired social function and relationships); and informational and support needs (i.e., management of illness, prognosis, treatment options and side effects, support groups, and complementary therapies) [6,7]. Therefore, they are likely to strongly seek love, hope/power, and the meaning or purpose of life [8,9]. They also search for other people's trust and understanding, such as these kinds of spiritual needs [10].

Thus far, studies assessing spiritual needs of cancer patients are predominantly of qualitative nature [4]. Moreover, the vast majority of these studies were conducted in Europe and America, leaving a gap in understanding the nature of patients' spiritual needs in other secular Chinese societies. Therefore, tools to assess the spiritual needs of Chinese cancer patients must be developed. Büssing and Koenig set up a spiritual needs model for patients with chronic diseases in 2010. The model of spiritual needs includes four (interconnected) core dimensions, namely, Connection, Peace, Meaning/Purpose, and Transcendence, which can be attributed to the underlying social, emotional, existential, and religious

* Corresponding author.

E-mail address: wangyan@shzu.edu.cn (Y. Wang).

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categories. Connection includes love, belonging, alienation, partner communication, and so on. Peace includes inner peace, hope, balance, forgiveness, distress, fear of relapse, and so on. Meaning/Purpose includes meaning in life, self-actualization, role function, and so on. Transcendence includes spiritual resources, relationship with God/Sacred, praying, and so on. At the same time, Prof. Büssing, a German scholar, developed the spiritual Needs Questionnaire (SpNQ) [5] to assess the spiritual needs of patients with chronic diseases in terms of Religious, Existentialistic, Inner Peace, and Active Giving. The instrument avoids exclusive religious terminology and is suited both in secular and in religious societies. The need for Inner Peace, which had the strongest relevance for patients with chronic pain diseases and cancer, can be interpreted as their intention to return to a peaceful state of being fully saved. The aspect of Actively Giving seems to be of outstanding importance as well because it can be interpreted as patients' intention to leave the role model of a "passive sufferer" to become an active, self-actualizing, and giving individual. The questionnaire was translated into the Chinese version (SpNQ-Ch-17) [11] and applied to chronic disease patients in Changhai Hospital of Shanghai, China in 2013. However, its applicability to cancer patients requires further verification. This study aims to explore the applicability of the Chinese version spiritual needs questionnaire for cancer patients and analyze its reliability and validity. Subsequently, it can provide clinical nurses with the tools to assess the spiritual needs of cancer patients. Furthermore, understanding the basic situation of Chinese spirituality requires providing evidence for spiritual care in clinical practice.

2. Methods

2.1. Research objects

We recruited a convenient sample of 457 cancer patients from a tertiary hospital in Xinjiang from March to July 2017. The inclusion criteria were as follows: a pathological diagnosis of a cancer, age ≥ 18 years, ability to read and complete the required questionnaire independently or with the help of the investigator, informed consent, and voluntary participation. The exclusion criteria were as follows: patients who express power and understanding obstacles and patients who have participated in similar research projects. After eliminating incomplete questionnaires, 457 samples were finally chosen. According to the odd and even questionnaire numbers, data were divided into two groups to do exploratory factor analysis and confirmatory factor analysis.

2.2. Measures

2.2.1. Patient characteristics

Self-designed questionnaire survey on demographic characteristics includes gender, age, religious belief, and educational level. The disease-related characteristics, include type of disease, months of diagnosis, and cancer stage of patients.

2.2.2. Study process of the Chinese version of SpNQ for cancer patients

The original SpNQ was developed by the German scholar Büssing, which included 27 items. Büssing applied the original SpNQ to 210 patients with chronic pain conditions (67%), cancer (28%), and other chronic conditions (5%). Factor analysis of the 19-item instrument (Cronbach's $\alpha = 0.93$) pointed to four factors, which can explain 67% of variance: *Religious Need* (18,19,20,21,22,23), *Need for Inner Peace* (2,6,7,8,13), *Existentialistic Needs* (4,10,11,12,16), and *Actively Giving* (15,26,27). The Cronbach's α coefficient of each dimension is 0.74–0.92 [5]. Therefore, Büssing

emphasized that the questionnaire can be used either as a diagnostic tool with 27 items or as a contextual 19-item research instrument (with a few optional items), which differentiates four main factors. All items were scored on a 4-point Likert scale from disagreement to agreement. The higher the score, the higher the degree of demand for the patient of this dimension. This questionnaire is currently translated into the following versions: English, Italian, French, Portuguese, and Polish, to name a few.

The Chinese version of SpNQ with 17 items (SpNQ-Ch-17) [11] was also developed by Prof. Büssing. The first Chinese edition of SpNQ with 27 items was translated by the team of doctors in Changhai Hospital in 2013. Under the principle of respecting the preliminary German and English versions, the bilingual (German-Chinese) German resident has validated the English version, identified unclear wording, and revised it according to the original author and finalized the Chinese version of SpNQ with 27 items. The questionnaire was applied to 168 patients with chronic diseases in Changhai Hospital and performed the reliability and validity tests. Finally, 17 items and five dimensions of questionnaires were formed through EFA: *Religious Praying* (18,19,20), *Religious Resources* (22,23), *Reflect/Release* (4,5,12) *Inner Peace* (6,7,8,10), and *Actively Giving* (13,15,16,26, 27). Compared with the SpNQ with 19 items, the number of dimensions and the items in each dimension have significantly changed, and the Cronbach's α coefficient of each dimension is 0.51–0.81.

The original author (same author of the original questionnaire and the author of the Chinese version) was contact to obtain the Chinese version of SpNQ with 27 items. Three bilingual (Chinese and English) experts checked the questionnaire. In addition, through a preliminary investigation and combination with the cultural characteristics of our country, we added supplementary explanation to item 23. The supplementary explanation was fed back to the original author, obtaining the consent and authorization to use it. The original expression of the Chinese version SpNQ item 23 is "To turn to a higher presence (i.e., God, Allah)?" now revised as "To turn to a higher presence (i.e., Chinese god, Buddha, God, or Allah)?"

2.3. Preliminary experiment (Pre-survey)

In March 2017, a total of 40 cancer patients were invited as preliminary experiment participants. The average time is 8–12 min to fill in the questionnaire. The entire questionnaire Cronbach's $\alpha = 0.91$. The results of EFA show that all the items of the questionnaire are valid. At the same time, we interviewed five participants, asking their opinion regarding this questionnaire or what they do not understand. All patients said that the content of the questionnaire was easy to understand.

2.4. Investigation method

With the convenience sampling method, the cancer patients were asked to fill in the questionnaires by themselves within 15 min. The investigator was tasked to explain the question the patient may have difficulty understanding. Among the total 480 questionnaires distributed, 468 questionnaires were retrieved, 457 returned questionnaires were valid, and the effective response rate was 95.21%. All the uncompleted questionnaires caused by any urgent affairs (examination, treatment, etc.) would be treated as invalid questionnaire. The ethical committees approved to conduct the survey.

2.5. Statistical analyses

Epidata 3.1 software was utilized to establish a database. Data

were analyzed by using IBM SPSS 19.0 and IBM AMOS 21.0. Descriptive statistics were tabulated as mean $\pm$ SD or n (%) by using the *t*-test and Pearson correlation analysis for the project analysis of SpNQ-Ch-27. The internal consistency reliability of the questionnaire was evaluated by Cronbach's α coefficient, and the split-half reliability was evaluated by using the Guttman Split-Half coefficient. EFA and CFA were utilized to evaluate the structural validity of the questionnaire. Principal component method (PCA) and rotation method (Oblimin) were employed to explore the structure of the questionnaire in the EFA. For CFA, Root Mean Square Error of Approximation (RMSEA), incremental fitting index (IFI), normed fitting index (NFI), comparative fitting index (CFI), non-standard fitting index (TLI), and other indicators were utilized to evaluate the questionnaire of the structure of the model fitting. We considered a level of $P < 0.05$ as statistically significant.

3. Results

3.1. Participants

As shown in Table 1, patients' mean age was 55.83 ± 12.87 , patients' mean months of diagnosis Median was 5.00, 66.52% were women. Most patients had no religious affiliation (79.87%). The patients with breast cancer were the most with 22.87%, and 54.41% patients were in the early cancer stage (Table 1).

3.2. Questionnaire item analysis

According to the distribution analysis of item option answers, the percentage of all item answers in the questionnaire was less than 80%, indicating that there were no items with skewed distribution. Discrimination analysis: the total scores were sorted in descending order. 27% of the total number of the highest branch office comprised the high score group, and 27% of the total number of the lowest branch office comprised the low score group.

Table 1
Characteristics of participants ($N = 457$).

Variable	n	%
Gender		
Men	153	33.5
Women	304	66.5
Age (years), Mean $\pm$ SD	55.87 $\pm$ 12.82	
Months of Diagnosis, $M(P_{25}, P_{75})$	5.00(1.00, 17.00)	
Nation		
Han	367	80.3
Others	90	19.7
Religious beliefs		
None	365	79.9
Religious	92	20.1
Education level		
Primary or below	98	21.5
Junior high school	155	33.9
High school and above	200	43.8
Unanswered	4	0.8
Cancer type		
Lung cancer	46	10.1
Endometrial/Cervical carcinoma/Oophoroma	87	19.0
Bladder/Renal cell carcinoma	31	6.8
Breast cancer	102	22.3
Gastric/Esophageal/Colon cancer	85	18.6
Leukemia	53	11.6
Others	42	9.2
Unanswered	11	2.4
Cancer stage		
Early (0–II)	247	54.0
Advanced (III–IV)	207	45.3
Missing data	3	0.7

Statistical significance exists between the high and low score groups of the questionnaire ($P < 0.05$). The correlation coefficient between each item and the total score of the questionnaire was 0.34–0.63, indicating that the relationship between the item and the subject was good. Each item has a high degree of differentiation and identification and is highly correlated with the subject [12]. Therefore, no item has been deleted.

3.3. Construct validity

According to the odd and even questionnaire numbers, data of 229 cases were analyzed for EFA and data of 228 for CFA.

3.3.1. EFA

IBM SPSS 19.0 was used to explore the factor of this questionnaire's odd number group. Primary factor analysis showed that a Bartlett's spherical test χ^2 value of the questionnaire was 3852.50 ($P < 0.05$). Then, Kaiser–Mayer–Olkin (KMO) value was 0.86, indicating that the item-pool is suitable for a factorial validation [13]. EFA, with principal component analysis, pointed to a six-factor solution, which can explain 63.08% of the variance. The factor loading value of the reserved items in the corresponding common factors of the observed variables is greater than 0.40, and the items with higher loads in the two and above factors are classified as the factors of the highest load [12–14]. We based on the four dimensions of the original theory. Now, we split the *Religious Need* into two sub-dimensions, namely, *Religious Needs–Praying* and *Religious Needs–Sources*. Then, we split the *Existentialistic Needs* into two sub-dimensions, namely, *Existential Needs–Reflection* and *Existential Needs–Release*. Table 2 presents the factor load structure matrix of the questionnaire. As shown in Table 3, Pearson correlation coefficient between each factor was 0.20–0.61, and the correlation coefficient between each factor and the total score was 0.62–0.83.

3.3.2. CFA

IBM AMOS 21.0 was utilized to construct the structural equation modeling of this questionnaire's even number group. Then, the structural equation was constructed according to the original theory and the results of the EFA. We found that RMSEA = 0.07, IFI = 0.93, NFI = 0.86, CFI = 0.92, TLI = 0.90, thereby indicating that the structure of the model fitting is reliable (Fig. 1).

3.4. Reliability

The reliability of the SpNQ-Ch-27 was evaluated with internal consistency coefficients (Cronbach's α). The total SpNQ-Ch-27's Cronbach's α was 0.90, and subscale Cronbach's α was *Inner Peace Needs* ($\alpha = 0.75$), *Actively Giving Needs* ($\alpha = 0.84$), *Religious Needs–Praying* ($\alpha = 0.95$), *Religious Needs–Sources* ($\alpha = 0.76$), *Existential Needs–Reflection* ($\alpha = 0.63$), *Existential Needs–Release* ($\alpha = 0.92$). The total SpNQ-Ch-27's split-half reliability was 0.82, and subscale split-half reliabilities ranged from 0.68 to 0.95.

3.5. Expression of spiritual needs in patients with cancer

As shown in Table 4, to analyze which needs were particularly relevant, we measure the intensity of the respective needs among the patients. Strikingly, all needs were expressed relatively high, particularly *Actively Giving Needs*. With respect to specific socio-demographic data, women had higher score in *Religious Needs–Praying* than men ($F = 17.93$; $P < 0.001$). Age was the influencing factor of *Religious Needs–Praying* ($F = 2.67$; $P < 0.05$). Patients with lower educational levels had lower needs for *Inner Peace* ($F = 3.24$; $P < 0.05$). Educational levels were the influencing factor of

Table 2
The Factor loading structure matrix of SpNQ-Ch-27.

Factors and Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Actively Giving Needs						
S25 To feel connected with family (including elders)?	0.785				0.424	
S27 To be assured that your life was meaningful and of value?	0.768					
S26 To pass own life experiences to others?	0.767					
S24 For being completely well?	0.687					
S15 To give solace to someone?	0.661				0.520	
S13 To turn to someone in a loving attitude?	0.589		0.541			
S14 To give away something from yourself?	0.532					
Religious Needs—Praying						
S19 That someone prays for you?		0.967				
S18 To pray with someone?		0.964				
S20 To pray for yourself?		0.96				
S12 To talk with someone about the possibility of life after death?		0.783				
Inner Peace Needs						
S10 To find meaning in illness and/or suffering?			0.735			
S6 To plunge into beauty of nature?			0.666			
S11 To talk with someone about the question of meaning in life?			0.666			
S9 To listening to touching music ?	0.494		0.618			
S8 To find inner peace?			0.511			0.407
S5 To dissolve open aspects of your life?		0.439	0.505	0.492		
S7 To dwell at a place of quietness and peace?			0.482			0.453
Existential Needs—Reflection						
S2 To talk with others about your fears and worries?				0.748		
S3 That someone of your religious community (i.e. pastor) cares for you?				0.735		
S1 To hope others pay more attention on me?	0.499			0.626		
S4 To reflect your previous life?	0.402			0.500		
Existential Needs—Release						
S16 To forgive someone from a distinct period of your life?					0.903	
S17 To be forgiven?					0.888	
Religious Needs—Sources						
S21 To participate at a religious ceremony (i.e. service, temple)?						0.767
S22 To read religious/spiritual books?						0.746
S23 To turn to a higher presence (i.e. Chinese God,Buddha,God, Allah)?		0.403				0.708

Table 3
Correlations among SpNQ-Ch-27 subscales and total Score.

Subscales	AG	RN-Praying	IP	EN-Reflection	EN-Release	RN-Sources
RN-Praying	0.269	—	—	—	—	—
IP	0.612	0.297	—	—	—	—
EN-Reflection	0.551	0.202	0.488	—	—	—
EN-Release	0.561	0.247	0.36	0.341	—	—
RN-Sources	0.426	0.407	0.324	0.313	0.379	—
Total Score	0.831	0.619	0.781	0.668	0.618	0.631

Note: AG: Actively Giving Needs; RN-Praying: Religious Needs—Praying; IP: Inner Peace Needs; EN-Reflection: Existential Needs—Reflection; EN-Release: Existential Needs—Release; RN-Sources: Religious Needs—Sources.

Existential Needs-Release ($F = 9.21$; $P < 0.001$). Interestingly, Religiosity affects the other five dimensions, except *Actively Giving Needs*. Type of cancer and cancer stage significantly influenced *IP* and *Religious Needs-Praying*, and type of cancer influenced *Existential Needs-Reflection* ($P < 0.05$) (Table 4).

4. Discussion

4.1. Validity evaluation of SpNQ-Ch-27

According to the results of questionnaire item analysis, SpNQ-Ch-27 all have higher discrimination, the reliability (Cronbach's α) of six dimensions are all greater than 0.6. After factor load analysis, the load value of each observation variable on its corresponding common factor is greater than 0.4; thus, no item was deleted [12–15].

4.1.1. Construct validity

This study found that EFA pointed to a six-factor solution of the SpNQ-Ch-27, which can explain 63.08% of the variance. In addition,

the load value of each observation variable on its corresponding common factor is greater than 0.4, which indicates that this questionnaire has a good construct validity. Moreover, the items with higher loads in the two and above factors are classified as the factors of the highest load [12–14]. The results of model fitting are shown, $\chi^2/df = 2.00$ (i.e., less than 3), RMSEA = 0.07, IFI = 0.93, NFI = 0.86, CFI = 0.92, TLI = 0.90, all within acceptable standards. Overall, the model of the questionnaire has a good fit among the cancer patients [15,16], which means that the theoretical model structure corresponds to empirical data, indicating that six dimensions can better reflect the spiritual needs of cancer patients.

4.1.2. Dimensions and item changes

The SpNQ-Ch-17 was applied to 168 patients with chronic diseases in Changhai Hospital. It was established by five dimensions with 17 items, which include *Religious Praying* (18,19,20), *Religious Resources* (22,23), *Reflect/Release* (4,5,12) *Inner Peace* (6,7,8,10), and *Actively Giving* (13,15,16,26,27). The 27 items, which were divided into six dimensions all have significance in our cancer patient study. In this study, the direct Oblimin method is employed because

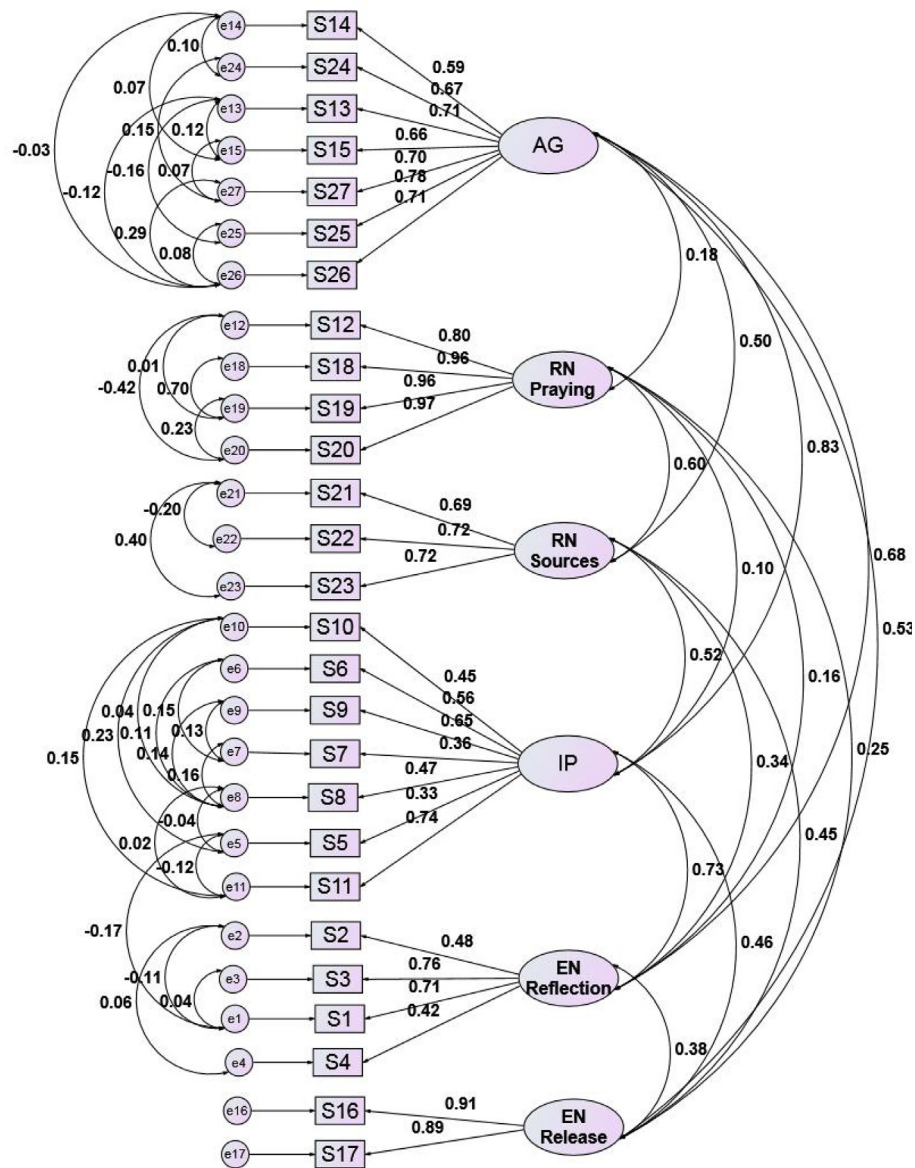


Fig. 1. The SEM of SpNQ-Ch-27.

the factors of the questionnaire are not independent. Thus, the Oblimin method can provide accurate correlations [17] and increase the load of each item on each factor by the joint effect between factors.

Dimensions named: we reserve four dimensions of SpNQ-Ch-17, namely, *Religious Praying*, *Religious Resources*, *Inner Peace*, and *Actively Giving*. According to the original theory [5], four main evaluation criteria and the SpNQ-Ch-17, the *Reflect/Release*, which consider the actual meaning, the *Existence* dimension was divided into two sub-dimensions, namely, *Existential Needs–Reflection* and *Existential Needs–Release*. Compared with the SpNQ-Ch-17, item S5 “To dissolve open aspects of your life?” previously belonging to the *Reflection/Release* dimension is now reassigned to the *Inner Peace* (IP) dimension. Such revision may be explained by the cancer patient possibly gaining peace of mind and living without any regrets by arranging own funeral. Item S12 “To talk with someone about the possibility of life after death?” previously belonging to the *Existence needs* (EN) dimension is now reassigned to *Religious Needs–Praying* dimension. Notably, the Chinese traditional culture

frequently avoids the discussion of death. Many cancer patients are likely to associate death with ghost/gods, which has a certain religious distinction. Item S16 “To forgive someone from a distinct period of your life?” previously belonging to the *Actively Giving* dimension is now reassigned to the *Existential Needs–Release* dimension, which may be explained by why cancer patients who no longer obsess with the old matters gained self-relief under the influence of disease. They no longer saw significant importance in seeing the previous state of things. This finding is consistent with the English version of SpNQ.

4.2. Reliability evaluation of SpNQ-Ch-27

In this study, the SpNQ-Ch-27's Cronbach's α was 0.90, and subscale Cronbach's α ranged from 0.63 to 0.95. The Cronbach's α of subscale were all greater than 0.70, except of *Existential Needs–Reflection*, suggesting that SpNQ-Ch-27 has good internal consistency [15]. Demand-reality reflects the low Cronbach's α coefficient of the dimension probably owing the following reasons:

Table 4
Scores of spiritual needs in patients with cancer (Mean $\pm$ SD).

Variable	n	AG	RN-Praying	IP	EN-Reflection	EN-Release	RN-Sources
All patients	457	2.01 $\pm$ 0.67	1.50 $\pm$ 1.16	1.54 $\pm$ 0.65	1.46 $\pm$ 0.72	1.66 $\pm$ 1.01	0.80 $\pm$ 0.87
Gender							
Men	153	2.01 $\pm$ 0.65	1.18 $\pm$ 1.08	1.49 $\pm$ 0.62	1.51 $\pm$ 0.73	1.59 $\pm$ 1.02	0.72 $\pm$ 0.87
Women	304	2.00 $\pm$ 0.68	1.66 $\pm$ 1.17	1.57 $\pm$ 0.66	1.44 $\pm$ 0.71	1.69 $\pm$ 1.01	0.84 $\pm$ 0.88
t		0.08	−4.35	−1.17	1.01	−1.01	−1.42
P		0.93	<0.001	0.24	0.31	0.31	0.16
Age(years) ^a							
<40	41	1.87 $\pm$ 0.67	1.80 $\pm$ 1.18	1.43 $\pm$ 0.66	1.30 $\pm$ 0.70	1.40 $\pm$ 0.88	0.85 $\pm$ 0.97
40–50	128	1.95 $\pm$ 0.65	1.65 $\pm$ 1.16	1.58 $\pm$ 0.60	1.38 $\pm$ 0.70	1.69 $\pm$ 1.04	0.85 $\pm$ 0.86
50–60	123	2.08 $\pm$ 0.66	1.49 $\pm$ 1.22	1.54 $\pm$ 0.67	1.51 $\pm$ 0.75	1.66 $\pm$ 1.06	0.88 $\pm$ 0.96
60–70	96	1.95 $\pm$ 0.68	1.22 $\pm$ 1.10	1.51 $\pm$ 0.65	1.46 $\pm$ 0.69	1.71 $\pm$ 0.95	0.60 $\pm$ 0.73
>70	64	2.14 $\pm$ 0.71	1.45 $\pm$ 1.08	1.58 $\pm$ 0.71	1.65 $\pm$ 0.73	1.70 $\pm$ 1.06	0.80 $\pm$ 0.85
F		1.84	2.67	0.53	2.20	0.77	1.72
P		0.12	0.03	0.71	0.07	0.54	0.14
Religious beliefs							
None	365	2.00 $\pm$ 0.69	1.38 $\pm$ 1.15	1.50 $\pm$ 0.65	1.42 $\pm$ 0.71	1.57 $\pm$ 1.01	0.68 $\pm$ 0.78
Religious	92	2.03 $\pm$ 0.61	1.97 $\pm$ 1.10	1.69 $\pm$ 0.64	1.62 $\pm$ 0.72	2.02 $\pm$ 0.92	1.25 $\pm$ 1.04
t		−0.44	−4.45	−2.43	−2.33	−4.12	−4.93
P		0.69	<0.001	0.02	0.02	<0.001	<0.001
Education level							
Primary or below	98	1.98 $\pm$ 0.68	1.30 $\pm$ 1.19	1.40 $\pm$ 0.67	1.46 $\pm$ 0.73	1.77 $\pm$ 0.99	0.62 $\pm$ 0.87
Junior high school	155	2.12 $\pm$ 0.68	1.62 $\pm$ 1.11	1.58 $\pm$ 0.64	1.65 $\pm$ 0.66	1.75 $\pm$ 1.05	0.88 $\pm$ 0.93
High school and above	200	1.95 $\pm$ 0.65	1.51 $\pm$ 1.19	1.60 $\pm$ 0.63	1.32 $\pm$ 0.73	1.56 $\pm$ 0.99	0.83 $\pm$ 0.81
F		2.85	2.36	3.24	9.21	2.13	3.00
P		0.06	0.10	0.04	<0.001	0.12	0.05
Cancer type							
Lung cancer	46	1.95 $\pm$ 0.74	1.21 $\pm$ 1.12	1.41 $\pm$ 0.66	1.37 $\pm$ 0.73	1.41 $\pm$ 1.02	0.84 $\pm$ 1.06
Endometrial/Cervical carcinoma/ophoroma	87	1.77 $\pm$ 0.61	2.08 $\pm$ 1.05	1.55 $\pm$ 0.58	1.30 $\pm$ 0.61	1.57 $\pm$ 0.90	0.73 $\pm$ 0.74
Bladder/Renal cell carcinoma	31	1.76 $\pm$ 0.57	1.46 $\pm$ 1.11	1.32 $\pm$ 0.66	1.61 $\pm$ 0.71	1.69 $\pm$ 0.97	0.97 $\pm$ 0.93
Breast cancer	102	2.19 $\pm$ 0.67	1.54 $\pm$ 1.18	1.57 $\pm$ 0.68	1.52 $\pm$ 0.78	1.77 $\pm$ 1.09	0.84 $\pm$ 0.84
Gastric/Esophageal/Colon cancer	85	2.13 $\pm$ 0.69	1.11 $\pm$ 1.09	1.58 $\pm$ 0.71	1.56 $\pm$ 0.66	1.67 $\pm$ 1.07	0.75 $\pm$ 0.90
Leukemia	53	2.04 $\pm$ 0.62	1.62 $\pm$ 1.21	1.72 $\pm$ 0.61	1.56 $\pm$ 0.82	1.79 $\pm$ 0.93	0.92 $\pm$ 0.94
Others	42	2.05 $\pm$ 0.63	1.05 $\pm$ 0.99	1.49 $\pm$ 0.63	1.25 $\pm$ 0.68	1.60 $\pm$ 1.08	0.52 $\pm$ 0.74
F		4.53	7.41	1.73	2.28	0.94	1.29
P		<0.001	<0.001	0.11	0.03	0.46	0.26
Cancer stage							
Early (0–II)	247	1.92 $\pm$ 0.64	1.61 $\pm$ 1.15	1.52 $\pm$ 0.63	1.44 $\pm$ 0.73	1.58 $\pm$ 0.97	0.80 $\pm$ 0.82
Advanced (III–IV)	207	2.11 $\pm$ 0.71	1.35 $\pm$ 1.17	1.57 $\pm$ 0.67	1.47 $\pm$ 0.70	1.75 $\pm$ 1.06	0.78 $\pm$ 0.94
t		−2.84	2.34	−0.86	−0.44	−1.85	0.23
P		<0.001	0.02	0.39	0.66	0.06	0.82

Note: AG: Actively Giving Needs; RN-Praying: Religious Needs–Praying; IP: Inner Peace Needs; EN-Reflection: Existential Needs–Reflection; EN-Release: Existential Needs–Release; RN-Sources: Religious Needs–Sources.

^a Five patients did not report age.

(1) Chinese people are usually shy to express their emotions; cancer patients are eager to prove the meaning of their existence but are also afraid of becoming a burden; thus, they chose to be silent, unwilling to express. (2) Cultural differences may lead to deviations in the understanding of the respondents. In this study we retain this dimension. Future research can consider increasing the number of items and raising the meaning of the item to improve its internal stability.

SpNQ-Ch-17 is congruent with its primary version, and the respective scales have satisfying to good internal consistency. It can reflect the basic spiritual needs of chronic patients. However, in the deep spiritual needs of patients with chronic diseases, the intensity of reflection is low. As a diagnostic tool, the stability of the scale is not good. Owing to the particularity of the disease, tumor patients often have hidden real thoughts when answering questions and must rigorously understand their spiritual needs. SpNQ-Ch-27 covers a wide range of topics and is relatively complete. It can provide in-depth reflection of spiritual needs and can be used as a diagnostic tool for spiritual needs. On the basis of the analysis of the survey data and the combination of Chinese culture, the scale is divided into six dimensions. The *Religious Needs* is subdivided into *Religious Needs–Praying* and *Religious Needs–Sources*, which are suitable for describing the understanding of spiritual needs in a secular society. The scale details the response of cancer patients to

the world. On the one hand, they are likely to forgive. On the other hand, the patient is likely to reflect on the meaning of existence from the reflection of reality. The scale meticulously reflects the needs of the cancer patient. In summary, SpNQ-Ch-27 is applicable to assess the spiritual needs of Chinese cancer patients.

4.3. Expression of spiritual needs in patients with cancer

The level of *Religious Needs–praying* for female cancer patients is higher than that of male patients, which is consistent with the previous research results [9,18]. Women are delicate in mind, sensitive to the perception of things around them; certain advantages of gender feelings and emotional expression exist; at the same time, owing to the special physiological structure of women, they easily produce somatization, interpersonal sensitivity, mental illness, and other issues [19]; in addition, given that women are in a weak position in the family and society, their social and psychological problems caused by their physical and mental health are lower than those of men [20]. The latter induces the female patients to seek spiritual comfort through prayer in the pursuit of “body-mind-spirit.” Interestingly, in this study, age is a factor affecting the *Religious Needs–Praying* of cancer patients, and Büssing [5] proves that the older patients are likely to seek the need for their peace of mind. The spiritual needs of patients with religious beliefs were

higher than those without religious beliefs, similar to the results of previous studies [11]. All religions believe that after the limited life of human beings, eternal life still exists. Religion is believed to be a way of helping people to live forever. This belief is the hope of the soul, and it is the effect of spiritual comfort and satisfaction [21]. The educational level can affect the *IP* and *Existential Needs-Release* of the cancer patients. Cancer patients with high educational levels receive further disease-related knowledge, and a strong and clear understanding of things. They also easily forgive others. A few scholars also suggest that no significant relationship exists between spiritual demand and educational level [9]. Different types and different stages of cancer have different effects on the physiological function of the patients. The *Inner Peace Needs* for advanced patients is higher than that of early patients, and the *Religious Needs-Praying* for advanced patients is lower than that of early patients. Stewart [22] believes that cancer patients have high spiritual needs before they know the news of death and before they die. They long for a profound feeling of calm. The advanced patients are affected by the change in the disease, and the ability to complete the praying ceremony is limited.

5. Conclusion

The Chinese version of the spiritual needs Questionnaire with 27 items (SpNQ-Ch-27) is applicable to cancer patients. It comprises a total of 27 items in six domains, namely, *Inner Peace Needs* (5,6,7,8,9,10,11), *Actively Giving Needs* (13,14,15,24,25,26,27), *Religious Needs-Praying* (21,22,23), *Religious Needs-Sources* (12,18,79,20), *Existential Needs-Reflection* (1,2,3,4), and *Existential Needs-Release* (16,17). All items were scored on a 4-point Likert scale from disagreement to agreement. The higher the score, the higher the degree of need for the patient of this dimension. The total Cronbach's α of this questionnaire was 0.90, and subscale Cronbach's α ranged from 0.63 to 0.95. The SpNQ-Ch-27 appears reliable with valid instruments to assess the spiritual needs in Chinese cancer patients.

The current study conducted a cross-sectional survey. Owing to geographical constraints, the sample size of patients with Christianity and Buddhism in the study was small, and the types of cancer were insufficiently uniform. Moreover, given the time and space factors, we simultaneously conducted questionnaire surveys in multiple hospitals, and the data collection was concentrated. Therefore, the EFA and the CFA were grouped by odd and even questionnaire numbers. In the future, the scale can be applied in different cancers for verification. Moreover, factors affecting the spiritual needs can be explored, thereby providing the basis for targeted humane clinical care.

Conflicts of interest

The authors declare no conflicts of interest.

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Appendices. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijnss.2019.03.010>.

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