



Original Article

Psychometric properties of the Persian version of the short-form survivor unmet needs survey (SF-SUNS) among patients with cancer



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ABSTRACT

Objective: Accurate identification of the unmet needs of patients with cancer and with a valid and reliable scale leads to the improvement of planning and implementation of nursing care. Thus, this study aims to translate the Short-Form Survivor Unmet Needs Survey (SF-SUNS) into Persian and to assess the psychometric properties of the Persian version among patients with cancer in Iran.

Methods: This study was conducted by methodological design. The translation of SF-SUNS was performed by translation protocol of the Quality of Life Assessment. Qualitative assessment of the face validity was conducted through cognitive interview and content validity was assessed through expert panel. This study used a convenience sampling method for 757 patients with cancer referring to Omid and Imam Reza hospitals in Mashhad, Iran. To determine the construct validity, confirmatory factor analysis and convergent validity were employed. Cronbach's alpha and intraclass correlation coefficient were calculated for reliability.

Results: Total score of unmet needs was 2.20 ± 0.73 , which indicates the average level of unmet needs in patients with cancer. Content validity ratio and content validity index scores were 0.88 and 0.91, respectively, Cronbach's alpha coefficient was 0.89, and intraclass correlation coefficient was 0.91. Based on confirmatory factor analysis, goodness-of-fit indices confirmed the model fit ($\chi^2/df = 4.43$, GFI = 0.90, TLI/NNFI = 0.91, CFI = 0.90, RMSEA = 0.067). In the subscale of unmet work and financial needs, 4 items had a factor loading lower than 0.4, which were omitted from the Persian version. The results revealed a significant difference in the unmet needs and quality of life of patients with cancer ($P < 0.001$).

Conclusions: The Persian version of SF-SUNS has desirable psychometric properties. It can be used to design and assess interventions to improve the quality of caring, cancer management, and as well as interaction between patients and healthcare providers.

Introduction

Cancer is one of the most common non-communicable diseases and the second leading cause of death worldwide.¹ According to the latest statistics of the World Health Organization (WHO) in 2020, 19.2 million new cancer cases were recognized in the world. In Iran, there is an average of 131 thousand new cases of various types of cancers annually. At present, there are 165 men and 139 women per 100,000 cases diagnosed with cancer.²

The consequences of cancer and its treatments have a wide-ranging impact on various aspects of life, like social, physical, and emotional

dimensions; thus, various services and caring systems are required to help these patients and their caregivers.^{3,4} Changes made by cancer lead to dysfunction in individual roles or communication patterns, decreased self-esteem, and inability to take care of oneself. Also, cancer threatens a patients' ability to play an effective role in his family and his community, causing the patient to feel a sense of inadequacy and reduced self-efficacy.⁵ When side effects of early-onset treatments of cancer subside, consequences of cancer and treatment including negative body image and sexuality disorders, fatigue, anxiety, depression and psychological distress, physical and social limitations, and sensorineural dysfunction, which can last for years after the completion of treatment.⁶⁻⁸

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For taking care of patients with cancer, in addition to treatments, it is necessary to know their needs in each stage of treatment because having this knowledge can greatly help health care members in planning and implementing appropriate therapeutic interventions for patients. Caring for patients with cancer is mostly based on technical knowledge which can be applied to all patients in general; however, nursing care should be client-centered and implemented according to the clinical situation, socio-economic, and psychological needs specific to each patient.^{9,10}

Regarding the importance of on-time identification of the needs in patients with cancer, the American Cancer Society states that providing optimal and accurate medical care services to these patients is dependent on assessing and recognizing their needs. Such an attitude would lead to the emergence of the concept of “Unmet Needs” in the care of patients. Unmet needs are those needs that require special levels of services to be met, and lead to achieving the desired level of well-being, where health care team members must be involved to meet the needs.^{10,11}

Understanding the needs of patients with cancer has a potential value in planning care and nursing practices, prioritizing care and how care is provided, communicating with the treatment team, and following up treatment.^{10,11} Studies have shown that the majority of patients with cancer have unmet needs in physical, psychological, and informational dimensions.^{12,13} Medium to high-level unmet supportive care needs have been identified in Iranian cancer survivors. In general, the majority of the unmet supportive care needs have been demonstrated in the health and information as well as psychological and social support domains.^{14–17} Also, in women with breast cancer, the highest perceived needs were observed in information and physical and daily life needs.¹⁷ Survivors of colorectal cancer also prioritized work and financial concerns over unmet needs.¹⁴ Also, the highest unmet needs have been reported in young people, comorbidity, female gender, and higher stage of the disease.^{14,15,17} The unmet needs can cause mental and physical disorders, causing excessive use of health services and increased costs of caring for these patients for the health system.^{12,18}

Although various tools have been developed to assess cancer-specific care needs, there is still a lack of comprehensive-scale for assessing unmet care needs among cancer survivors in routine clinical practice.¹⁹ The scales most commonly used to assess unmet needs include Survivors Unmet Needs Survey (SUNS), Supportive Care Needs Survey, and Cancer Survivors' Unmet Needs Measure 8.^{20–22} SUNS assesses the unmet needs over the past month where the main distinction from other scales is developing and evaluating a population-based sample of long-term cancer survivors. It presented strong psychometric proprieties with acceptable test-retest reliability and good internal consistency and there was clear evidence of face, content, and construct validity.^{20,23} Other scales, such as Supportive Care Needs Survey, have been developed for short-term (6–24 months after treatment) and breast cancer survivors.²¹ Also, the Cancer Survivors' Unmet Needs Measure has a relatively large number of items on quality of life while no items on financial unmet needs.²² Cancer survivors face physical, cognitive, functional, and psychosocial problems, as well as work-related and financial concerns, but the above two scales do not clearly identify the majority of issues survivors are asking for help. SUNS identifies issues that have not been addressed and determines the level of assistance required for health care planning as well as resource allocation.^{20,23}

Providing sufficient information and evidence for nurses to improve the care and quality of life of patients with cancer is very important. The essential role of identifying unmet needs in designing, planning, and providing care interventions for patients is clear and will not be achieved without the availability of a Persian questionnaire compatible with Iranian-Islamic culture. Also, there is no Persian version of a population-based scale to assess unmet needs in cancer survivors. Thus, the present study was designed to translate the Short-Form Survivor Unmet Needs Survey (SF-SUNS) into Persian and determine the psychometric properties of the Persian version. It can be used to identify the needs of patients with cancer on time along and improve the management and the accurate implementation of care interventions.

Methods

This methodological study was conducted among patients with cancer referring to Omid and Imam Reza Hospital in Mashhad from September 2019 to January 2021. After contacting the supervisor of the questionnaire design team, Dr. Hall and Dr. Sam Lawson at the University of Newcastle, Australia, permission was granted to perform the psychometric study. In this study, SF-SUNS translation and psychometric properties including face, content and structure validity, and Persian version reliability in patients with cancer in Iran were examined.

Translation of SF-SUNS

The SF-SUNS was translated from the original language (English) to the target language (Persian) by the Forward-Backward approach. For this purpose, the translation protocol of International Quality of Life Assessment was used.²⁴

Initially, the original version was translated independently and simultaneously into the Persian language by 2 persons fluent in English (translator 1 and translator 2). Then, in reverse translation, the Persian version was translated in English by two translators independent of the translators of the first translation, one of whom was a native English speaker (translator 3 and translator 4). Translators 1 and 3 were not aware of the purpose of the tool and the study. Finally, the process of adapting the translated versions and comparing them with the English ones was performed by the translators (1, 4) and authors (ERT, MR, and AH). Then, to ensure the proper transfer of concepts and correct translation, the questionnaire was sent to five experts in Persian literature. The Persian version was prepared after receiving the opinions.

Validity

Cognitive interviews and pre-tests were performed with the target group to determine the qualitative face validity. Interviews were conducted by face-to-face interviews on 10 patients with cancer regarding the relevance, simplicity, and clarity of each item, and accurate measurement of the real variable by the Persian version. The inclusion criteria were as follows: (1) age between 18 and 70 years old, (2) having cancer diagnosed by an oncologist and pathologic examination, (3) having a history of more than 12 months of cancer, (4) no history of psychotic disorders, depression, dementia, or suicidal behavior, (5) and being at the post-treatment stage. The exclusion criteria were all types of cancers with benign tumors, *in-situ* cancers and non-melanoma skin cancers, and institutionalized survivors. The target group was asked to express their suggestions and comments to better understand each item or the placement of the words and phrases.

During the validation, the content validity should be re-evaluated. To further determine the conceptual and content equivalence (clarity) of the items of the Persian version of SF-SUNS, they were evaluated by ten members of an expert panel.^{25,26} The questionnaire was checked for the relevance, necessity, clarity, and simplicity of each item with the entire scale being also checked by the experts panel. Feedback from experts was applied on the items about grammar, wording, item allocation, and proper scoring.

In the content validity, the Lawshe's method was used for calculating the content validity ratio (CVR).^{27,28} The Initial Persian questionnaire was given to the Experts panel including 10 oncologists, oncology nurses, and faculty members of nursing about determining CVR and content validity index (CVI). Inclusion criteria for the experts' panel included (1) having at least 5 years of experience of caring for cancer patients, and (2) being familiar with the process of scale development and adaptation for faculty members of nursing.

CVR and CVI were calculated for quantitative content validity. Experts panel opinions are determined by calculating the CVR for the necessity of each item. Experts' response for each item is classified as “necessary (3), useful but not necessary (2), not necessary (1)” where

CVR score over 0.62 for 10 experts is acceptable. CVI is the ratio of experts agreeing on the relevance of each item, which is calculated as follows: the number of experts giving each item a score of 3 and 4 (related and strongly related) divided by the total number of experts. The rating range of this index includes “not relevant (1), needs major reform (2), relevant but needs revision (3), and strongly relevant (4)”. The CVI score for each item greater than 0.79 is appropriate and the CVI score less than 0.70 is unacceptable and should be eliminated; finally, the item needs to be changed and revised if the score is between 0.70 and 0.79.^{29,30}

The construct validity of the Persian version of SF-SUNS was examined with factor analysis and convergent validity. Polit and Beck (2007) believe that the sample size at least 5 times the number of items should be recruited for factor analysis.²⁹ Thus, using a convenience sampling method, 757 patients with cancer referring to oncology specialized clinics at Omid and Imam Reza hospitals in Mashhad completed the questionnaire. The patients were asked to record their opinions on a 5-point Likert scale from strongly agree to strongly disagree. Confirmatory factor analysis (CFA) was used for the construct validity of the Persian version of SF-SUNS. Regarding convergent validity, the correlation was investigated between the Persian version of SF-SUNS and the Persian version of European organization for research and treatment of cancer (EORTC) quality of life questionnaire (QLQ-C30) through Pearson correlation coefficient.^{26,31} IBM SPSS Statistics 22 and IBM SPSS Amos 24 software were employed for statistical calculations where *P*-value less than 0.05 was considered significant.

Reliability

Internal consistency and stability were used to calculate the reliability of the questionnaire. To calculate the Cronbach's alpha coefficient, the questionnaire was provided to 40 patients with cancer who were selected through simple sampling. Cronbach's alpha ranges from 0 to 1; higher scores indicate greater reliability, where at least a level of 0.7 is recommended for alpha. For stability, the test-retest method was performed. In this study, 30 patients completed the questionnaire again with an interval of 2 weeks, and the results were determined by the intraclass correlation coefficient (ICC). Data were analyzed using a single-rating, absolute-agreement, 2-way random-effects model. Also, the 95% confident interval of the ICC estimate was used as the basis to evaluate the level of reliability. The ICC range is between 0 and 1 where values less than 0.5 represent poor reliability, values between 0.5 and 0.75 indicate moderate reliability, values between 0.75 and 0.9 show good reliability, and values greater than 0.90 reveal excellent reliability.^{26,32}

Study instruments

Sociodemographic and clinical questionnaire

To collect data, patients with cancer completed a demographic and clinical questionnaire. The demographic questionnaire captured age, gender, occupation status, marital status, level of education, duration of cancer, and the type of cancer, treatment type, and history of comorbidity.

SF-SUNS

The SF-SUNS with 30 items surveys four domains, including the Unmet Information Needs (3 items), Unmet Work and Financial Needs (8 items), Unmet Needs for Access and Continuity of Care (6 items), as well as Unmet Coping, Sharing and Emotional Needs (13 items). This questionnaire assesses the unmet needs of patients in the past month. The answers are in the form of a 5-point Likert scale ranging from “no unmet need” (0) to “very high unmet need” (4). A domain score was then calculated by summing all item responses (with response codes from 0 to 4) within each domain and dividing by the total number of domain items. In general, the range of scores is within 0–120, with higher average scores indicating a greater need for receiving supportive care and medical services. Short-form psychometrics were studied on 1589 patients with cancer where the Cronbach's alpha for 4 subscales was above 0.8

and the ICC was calculated 0.9. The important point about the short-form of this questionnaire is the ability to identify between treated patients and those who have not yet received any treatment.²³

EORTC QLQ-C30

EORTC QLQ-C30 is a multidimensional questionnaire consisting of 30 items assessing the quality of life in 5 functional scales (physical function, role-playing, emotional, cognitive, and social) plus three symptom scales (fatigue, pain, and nausea and vomiting), and additional symptoms commonly reported by patients with cancer (dyspnea, appetite loss, sleep disturbance, constipation, and diarrhea), along with economic problems caused by illness, and a global scale of quality of life. The score of each scale is set within 0–100. In the functional and global scales of quality of life, a higher score indicates better performance and quality of life, while in the other scale of higher score symptoms, it indicates that the symptom is more difficult.^{33,34} The validation of the Persian version of EORTC QLQ-C30 was conducted on 168 patients with newly diagnosed breast cancer. Cronbach's alpha coefficient would range from 0.48 to 0.95. The reliability coefficient (ICC) was calculated from 0.48 to 0.98 in subscales.³⁵ Also, Cronbach's alpha in the present study was 0.91, indicating good internal consistency.

Ethical considerations

The study was performed with the ethic code IR.MUMS.-REC.1398.157 approved by Mashhad University of Medical Sciences. The ethical considerations in the study followed the Ethical Guidelines of the Declaration of Helsinki. After obtaining the required permission and coordination with the related authorities in Omid and Imam Reza hospitals in Mashhad, participants with inclusion criteria were selected. The purpose of the study was explained for each participant, and informed consent was obtained from all participants included in the study. They were also assured that the information received from them would be confidential and they could leave the research at any time of the study if they wished.

Results

Descriptive analysis

This study was conducted on 757 patients with cancer with the mean age 54.9 ± 3.11 years old. Also, the majority of the patients 387 (51.1%) were male (Table 1). The most unmet needs of the patients were in the domain of Unmet Work and Financial Needs with 2.47 ± 0.95 out of 4, which indicated a moderate level of unmet needs of patients with cancer.

Validity

After the translation, qualitative face validity of the Persian version was used to assess the difficulty of understanding the items and phrases. None of the items were changed for cultural conflicts, and all of them were used in the content validity.

The validity of the content was assessed by the experts' panel where none of the items were changed, eliminated, or added. By calculating the scores, the CVR was calculated about 0.84–0.94, and the necessity of 30 items was confirmed. Also, CVI was estimated on every 30 items to determine the level of relevance of items with the purpose of SF-SUNS. Scale content validity index (S-CVI) was performed by the Scale-level Content Validity Index, averaging calculation method (S-CVI/Ave) where the CVI was calculated about 0.91. Then, to confirm the validity of SF-SUNS in the Iranian patients with cancer, we used CFA based on structural equation modeling.

The normality of the data was confirmed using the Kolmogorov–Smirnov test and the Q–Q plot diagram before the CFA; thus structural equation modeling was used. Also, to confirm the adequacy of the sample size, the Hoelter index was used.^{36,37} It showed that considering

Table 1
Social, demographic, and clinical characteristics of patients ($n = 757$).

Characteristics	Data
Age (Year, range, Mean \pm SD)	(21–76) 54.9 \pm 3.11
Time since diagnosis (Month, range, Mean \pm SD)	(12–235) 20.7 \pm 2.01
Gender, n (%)	
Female	370 (48.9)
Male	387 (51.1)
Marital status, n (%)	
Single	56 (7.4)
Married	612 (80.8)
Divorced	12 (1.6)
Widow	77 (10.2)
Education status, n (%)	
Illiterate	64 (8.5)
Under diploma	299 (39.5)
Diploma	244 (32.2)
Academic	150 (19.8)
Occupational status, n (%)	
Unemployed	500 (66.1)
Employed	147 (19.4)
Retired	110 (14.5)
Type of cancer, n (%)	
Digestive cancer	302 (39.9)
Breast cancer	118 (15.7)
Lung cancer	103 (13.6)
Others	234 (30.8)
Stage of disease, n (%)	
I	382 (50.5)
II	276 (36.5)
III	70 (9.2)
IV	29 (3.8)
Treatment type, n (%)	
Surgery	36 (4.8)
Surgery and chemotherapy	206 (27.2)
Surgery and radiotherapy	4 (0.5)
Combination of treatments	511 (67.5)
History of comorbidity, n (%)	
Yes	602 (79.5)
No	155 (20.5)

SD: Standard deviation.

the error of 0.05, the minimum sample size for CFA is sufficient of 210 patients. In this study, 757 patients with cancer and with the criteria of the target group participated in the construct validity stage. CFA and goodness-of-fit indices were used for confirming the factors. Structural equation experts have no agreement about which goodness-of-fit indices have the best estimate of the model, and thus a combination of indices must be used.³⁸ The χ^2/df was calculated 4.43, CFI was 0.90, and RMSEA was 0.067. As seen in the results, χ^2/df is within 2–5, while GFI, TLI/NNFI, and CFI indices are higher than 0.9, with RMSEA index being less than 0.08,³⁹ indicating the acceptable goodness-of-fit indices, and therefore, the proper fit of CFA. Further, the model was approved according to the fit indices (Table 2). In this analysis, all items had a factor loading above 0.4,⁴⁰ but 4 items “Finding car park that I can afford at the

Table 2
The Fit model indices of the CFA for the Persian version of SF-SUNS.

Fit indices	Optimal scores	The scores obtained in this study
χ^2/df	$1 < \chi^2/df < 5$	4.43
GFI (Goodness-of-fit index)	$0.90 < GFI$	0.90
TLI/NNFI (Tucker–Lewis index/Non normed fit index)	$0.09 < TLI/NNFI$	0.91
CFI (Comparative Fit Index)	$0.90 < CFI$	0.90
RMSEA (Root Mean Square Error of Approximation)	$0.05 < RMSEA < 0.08$	0.067

CFA, confirmatory factor analysis; SF-SUNS, Short-Form Survivor Unmet Needs Survey.

hospital or clinic”, “Understanding what is covered by my medical insurance or benefits”, “Knowing how much time I would need away from work”, and “Doing household chores (cooking, cleaning, home repairs, etc.)” had a loading factor of 0.16, 0.17, 0.26, and 0.15, respectively, which were eliminated from the Persian version. The diagram of a CFA of the Persian version of SF-SUNS is presented in Fig. 1.

Pearson correlation coefficient was used to measure the correlation between the Persian version of SF-SUNS and the EORTC QLQ-C30 scale. The results revealed that there was a negative correlation between the functional plus global scales of EORTC QLQ-C30 and overall the SF-SUNS domains ($r = -0.687$, $P < 0.001$), while a positive correlation was found between symptom scales and overall the SF-SUNS domains ($r = 0.467$, $P < 0.001$). The results indicated acceptable convergent validity of the Persian version of SF-SUNS.

Reliability

Cronbach's alpha test was performed to determine the internal consistency of the Persian version scale, which was calculated about 0.89, and obtained 0.78–0.87 for all of the domains. The reliability correlation coefficient of test-retest for 4 domains was higher than 0.80 and between 0.83 and 0.87. The ICC was 0.91 (Table 3).

Discussion

As the number of cancer survivors increases in Iran, their unmet needs should be determined by appropriate scales according to their cultural and social status. Scales help in determining the unmet needs of cancer survivors for which nursing and healthcare providers prepare better and more accurate care. In a critical appraisal of needs assessment scales in patients with cancer, the SUNS and SF-SUNS questionnaire had the highest score based on validity, reliability response rate, and applicability.⁴¹ The validity and reliability of the Persian version of SF-SUNS showed that this questionnaire has desirable psychometric properties and is consistent with the findings of the original version,^{23,42} indicating the validity of the Persian version of the SF-SUNS to assess the unmet needs of the Iranian patients with cancer.

In this study, the highest prevalence of unmet needs was work and financial concerns, followed by health and information domain. In other studies, the most frequently reported unmet needs of Australian cancer survivors were help with psychosocial issues, physical issues, information about available services, and peer support.⁴³ Also, very few cancer patients have mainly reported unmet needs in the post-treatment phase regarding the healthcare system and information, the psychological and the physical, and daily living domain.⁴⁴ More than 70% of young adult patients with cancer in Japan reported unmet supportive care needs. Their top unmet needs included psychological needs, physical and daily living needs, health system, information needs, and sexuality needs.⁴⁵ Wang et al. reported a wide range of unmet needs in patients with advanced cancer. The three most commonly reported domains for patients were psychological, physical, and healthcare service plus information.¹² In another study, Edib et al. reported that psychological domain was the most mentioned need, followed by physical, patient care needs, and health information domain.⁴⁶

The results showed that the work and financial concerns domain constituted the greatest unmet needs of Iranian patients with cancer. The out-of-pocket expenses such as prescription drug co-payments, insurance premiums, and high treatment expenditure could be the reason for the high unmet needs. In the long-term, decreasing funds, limited social work resources to identify and refer for services, patient reluctance to discuss financial distress with their health care team, and inefficiencies to return to work often lead to unmet needs in the work and financial concerns domain.

In our study, to evaluate the psychometric properties of Persian version of SF-SUNS, the face, content, construct, convergent validity, and reliability were used. Participants were recruited at two central main and

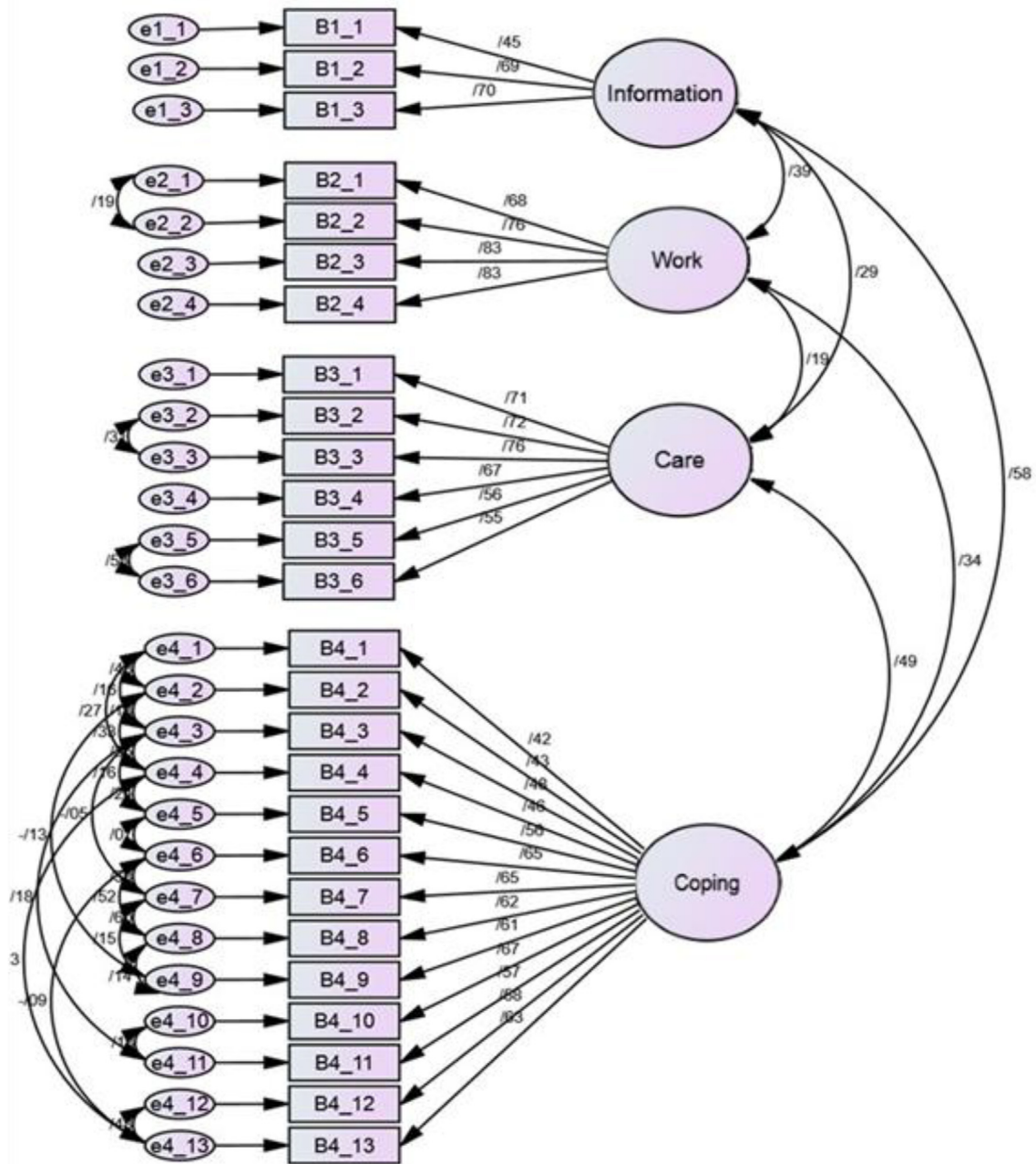


Fig. 1. Path diagram of a confirmatory factor analysis of Persian version of SF-SUNS. SF-SUNS, Short-Form Survivor Unmet Needs Survey.

specific hospitals that admit cancer patients in Mashhad, Iran. To confirm the content validity of SF-SUNS, CVI was within 0.84–0.94, and CVI was calculated 0.91. Also, all items of the Persian version were approved according to cultural and social status, which is in line with the results of previous studies.^{23,47,48} Confirmation of content validity indicates the expert panel reached a broad consensus about the good content Persian version of the SF-SUNS. Also, the content of SF-SUNS was highly appropriate due to the situation of patients with cancer in the Iranian society.

In the CFA for the construct validity of the SUNS-SFC, the original four-factor structure was confirmed by the results. The results of CFA revealed that the Persian version had acceptable goodness-of-fit and indices were higher than 0.90 while the REMSA was less than 0.80. In this regard, the strength of the study has been a large sample size with different mean ages and in a different group of gender, stage of the disease, and type of the disease being probably compelling reasons to justify in the present study.

Also, four items in the dimension of unmet work and financial needs had a factor loading of less than 0.4, which were eliminated from the questionnaire. Nevertheless, all items were confirmed at the domains of information needs, access and continuity of care, and coping, as well as sharing and emotional needs. In the Chinese version of the SF-SUNS, after performing the stages of exploratory factor analysis and CFA, all items had the desired factor loading and four domains were approved.⁴⁷ In the Portuguese version, which was performed on patients with myeloma, half of the items were eliminated from the dimension of unmet work and financial needs; items related to the time it takes to return to work and find a car park at the hospital or clinic.⁴⁸ These items were also eliminated from the Persian version due to a factor of less than 0.4. These items can depend on the patient's characteristics such as age, occupation status, lack of personal vehicle, and insurance status. In the two studies,^{47,48} the majority of patients are typical of the target population and they were retired or do not drive. However, the elimination of items

Table 3

Mean (Standard Deviation), Internal consistency and test-retest reliability for each category of the Persian version of SF-SUNS Scale.

Domain	Item	Mean (SD)	Cronbach's alpha coefficient (95% CI)	Intra-class correlation coefficient (95% CI)
Unmet Information Needs	3	2.44 (0.95)	0.78 (0.74–0.81)	0.86 (0.83–0.89)
Unmet Work and Financial Needs	4	2.47 (0.95)	0.80 (0.76–0.83)	0.83 (0.81–0.86)
Unmet Needs for Access and Continuity of Care	6	2.34 (0.98)	0.83 (0.80–0.87)	0.84 (0.81–0.87)
Unmet Coping, Sharing and Emotional Needs	13	2.06 (0.93)	0.87 (0.83–0.90)	0.87 (0.84–0.90)
Total	26	2.20 (0.73)	0.89 (0.86–0.93)	0.91 (0.88–0.94)

SD, Standard deviation; CI: Confidence interval.

can also be due to cultural and social differences, the type of cancer, and time since of survivorship between studies.

Regarding convergent validity, a negative correlation between the domains of the Persian version and the EORTC QLQ-C30 demonstrated the acceptable convergent validity of the SF-SUNS. As expected, moderate to high unmet needs in patients with cancer would reduce their quality of life. Consistent with this study, results of studies also showed that patients with various types of cancer experienced poor quality of life due to high unmet needs. Thus, knowledge about the unmet needs of patients with cancer is necessary to help patients attain good quality of life, self-care management, and reduce disease progression.^{9,49–51}

The results of the present study indicated that the Persian version of the questionnaire had also high reliability ($\alpha = 0.89$ and $ICC = 0.91$). In the Chinese, Portuguese, and English versions, the Cronbach's alpha was higher than 0.7. For each SF-SUNS version, Cronbach's alpha indicated acceptable to excellent internal consistency reliability. Also, the Persian and Chinese versions had an ICC above 0.80, indicating compatibility with the original version and good internal stability.^{23,42,47,48}

Limitation and recommendation

One of the limitations of the present study was the illiterate population for whom the researchers read the questionnaire, which may have not provided the same interpretation of the questions. So, there may have been information bias as the data were collected. The generalizability of the study is another limitation; the validity and reliability process of the Persian version are limited to a specific region, so it is better to conduct more validity and reliability steps with more diverse samples from different parts of the country. Also, there may be recall bias as the data were collected by self-reported questionnaires with the data collection being conducted during the COVID-19 pandemic; thus, the generalizability should be done with caution.

Conclusions

The Persian version of the SF-SUNS was confirmed by cross-cultural adaptation with validity and reliability methods. It can be used to determine the unmet needs of Iranian cancer survivors and can lead to effective care as well as oncologic nursing interventions. The healthcare providers can have caring, counseling, training, and supporting plans based on awareness about these needs. Implementing care based on unmet needs can improve the quality of life, thus increasing the prognosis and survival of patients.

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Authors' contributions

ERT, MR, ZSM, and AH contributed to the study's conception and design. Material preparation, data collection and analysis were performed by ERT, MR and JJ. The first draft of the manuscript was written

by ERT. ZSM and AH critically reviewed the manuscript. All authors read, edited and approved the final manuscript.

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Declaration of competing interest

None declared.

Ethics statement

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