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Validation of the FACIT-Sp-12 in a Dutch cohort of patients with advanced cancer

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Abstract

Objective: Although the Dutch Functional Assessment of Chronic Illness Therapy—Spiritual Well-Being 12 Item Scale (FACIT-Sp-12) has been used in several Dutch studies, no study has assessed the measurement properties of the translation. The aim of this study was to perform an item-reduction analysis, confirmatory factor analysis (CFA), test of reliability, and test of convergent validity.

Methods: From the baseline data of a cohort study on experienced quality of care and quality of life (eQuiPe study), 400 advanced cancer patients without missing values on any of the variables were selected. In addition to demographic and religious/spiritual characteristics, study measures included the FACIT-Sp-12 and the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-C30 (EORTC-QLQ-C30).

Results: Item reduction analysis showed that Items 4 and 8 had low correlations to the total scale (<0.30). Items 6 and 7, and Items 9, 10, and 11 were highly correlated (>0.75). CFA indicated a good fit for a three-factor structure with Meaning, Peace and Faith, and good Cronbach's α coefficients for the total as well as the subscales (0.71–0.86). The removal of Items 4, 8, and 12 further improved the goodness of fit and Cronbach's α coefficients. Convergent validity was adequate with the EORTC-QLQ-C30.

Conclusion: Our analysis of the FACIT-Sp-12 revealed serious questions about three items and concerns about the Faith subscale. These problematic items deserve further attention so should be interpreted with care when using this scale. A future study could look into the items and test possible replacements.

KEYWORDS

cancer, FACIT-SP-12, oncology, palliative care, psychometric properties, spirituality, spiritual care, spiritual well-being, The Netherlands

1 | BACKGROUND

Taking care of patients' spiritual well-being (SWB) is an important aspect of palliative care. According to the World Health Organization definition of palliative care, this type of care prevents and relieves

suffering through the early identification, correct assessment and treatment of physical, psychosocial or spiritual problems.¹ A widely used scale developed to assess SWB in cancer patients is the Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being (FACIT-Sp-12).² The scale was developed in the 1990s and

addressed the need for a brief measure suitable for patients from diverse religious and spiritual backgrounds.³

A translation of the FACIT-Sp-12 into Dutch was certified in 2011 by FACIT.org and since then the scale has been used in multiple Dutch studies among patients with cancer.^{4–6} However, no study has yet looked at its measurement properties. Globally, the FACIT-Sp-12 has been tested multiple times for various populations (e.g., cancer, HIV/AIDS, elderly) in different contexts (e.g., Brazil, Denmark, Korea, Iran, Jordan, Norway, United States).^{2,7–21} Nevertheless, we deemed specific testing of the FACIT-Sp-12 in the Dutch context to be important. Namely, the Netherlands is a highly secularized society, with secularization understood as “the falling off of religious beliefs and practices, in people turning away from God, and no longer going to Church”.²² This process has been underway for some time as a side effect of Western industrialization and modernization, and accelerated after WWII when the religious landscape changed drastically by an exodus of believers from their churches.²³ The secularized context might affect the suitability of the FACIT-Sp-12 to measure SWB, particularly for the subscale Faith. Would the FACIT-Sp-12 perform differently in a context in which more than 50% of people identify as religiously unaffiliated (and only 14% regularly visit a church) compared to 23% in the United States in which the scale was first developed?^{24,25}

To assess measurement properties of the FACIT-Sp-12, we used the checklist of the COnsensus-based Standards for the selection of health Measurement INstruments.²⁶ We furthermore employed the nine-step framework of Boateng et al.²⁷ that outlines best practices for developing and testing scales for health research to help indicate which parts are missing for the original American FACIT-Sp-12 and translations, specifically the Dutch translation. We will briefly summarize these steps.

The items of the original American FACIT-Sp-12 were developed based on interviews with 45 American cancer patients and 15 oncology specialists.^{2,28} To assess content and face validity, these items were then evaluated by expert panels that included several American hospital chaplains, and target population judges that included over 200 American and Puerto Rican patients.² Items were pretested by respondents in several rounds by verbalizing the mental process involved in providing answers (see for an English study of this process²⁹). At this stage, the Dutch version of the FACIT-Sp-12 comes into the picture. It was translated through a rigorous version of the double-back-translation method by FACIT.org.³⁰ First, two independent professional translators translated the FACIT-Sp-12 and a third translator reconciled their versions. Second, this version was translated back to English by a native English speaker also fluent in Dutch and then reviewed by a representative of FACIT. Finally, three independent reviewers, FACIT, and a number of Dutch patients assessed the final version.

The next steps concentrate on the testing of the scale. With regard to item reduction, some studies found problematic items such as the reversed Items 4 and 8.^{9,16,19,20} Item reduction for the Dutch version was performed by FACIT.org, unfortunately data of this process are not available.³⁰ For the factor analyses, exploratory

factor analysis (EFA) originally proposed a two-factor structure with an eight-item Meaning/Peace subscale and a four-item Faith subscale for the American FACIT-Sp-12.² A subsequent EFA suggested a three-factor structure that has since then been widely accepted.^{13,15,31} It divided the previous Meaning/Peace subscale into two subscales: the subscale Meaning, measuring a cognitive dimension of spirituality, and Peace, measuring an affective dimension. The subscale Faith remained unchanged. A confirmatory factor analysis (CFA) of the two- and three-factor structures showed better goodness-of-fit-indices for the latter.^{7,9,14,15,17,19,31,32} No study has performed an EFA nor a CFA for the Dutch FACIT-Sp-12.

Reported internal consistency with Cronbach's α coefficient for the FACIT-Sp-12 and its different translations was high: between 0.65 and 0.93 for the total scale, and the two or three subscales.^{2,7,8,10,13–16,19–21,31,33} For the total Dutch FACIT-Sp-12 a coefficient of 0.79–0.85 was reported across five samples including two cancer patient samples.⁴ Test-retest reliability was only tested for the Spanish and Portuguese translation and was between 0.67–0.70.^{14,21} Regarding criterion validity, concurrent validity testing showed moderate to strong correlations between the FACIT-Sp-12 and quality of life (QoL) measures, and inverse correlations with depressive symptoms.^{2,14} Predictive validity testing showed no significant associations with hospital length of stay and destination at discharge.⁸ Regarding construct validity, convergent validity testing showed positive associations with mood states, religion and spirituality measures, hope, meaning and self-transcendence; and negative correlations with depression, anxiety and spiritual distress.^{2,8,14,15,21} Discriminant validity testing showed weak (positive) associations with social desirability.² No validity tests have been performed for the Dutch FACIT-Sp-12.

Following gaps in some steps for best practices for the validation of the Dutch FACIT-Sp-12, the objectives of this study are: (a) to perform an item reduction analysis through interitem and item-to-total correlations; (b) confirm factors in a CFA; (c) perform a test of reliability; and (d) test convergent validity following the hypothesis that the meaning and peace subscales have high correlations, and the faith subscale a low correlation with QoL. As to whether the FACIT-Sp-12 performs differently in a highly secular context, results of these analyses will be compared to previous analyses in other contexts. This further testing of the Dutch FACIT-Sp-12 will broaden the understanding of its usefulness to assess SWB in Dutch patients with advanced cancer.

2 | METHODS

2.1 | Sample

For this study we randomly selected 400 patients out of 1103 patients with advanced cancer from the baseline data of a prospective, multicenter cohort study on experienced quality of care and QoL of patients with advanced cancer and their relatives (eQuiPe study, see for the full study design³³). Guidelines for psychometric research

suggest approximately 300–450 participants as appropriate for factor analysis,²⁷ so selecting a random 400 participants gave us more than enough participants for a rigorous evaluation. Missing data was handled with listwise deletion because less than 5% of the data was missing with an arbitrary missing data pattern. The baseline data were collected from 2017 to 2020 through the departments of medical oncology, pulmonology, and/or urology from 40 hospitals in The Netherlands. The inclusion criterium was a diagnosis of a solid metastasized tumor (stage IV). To reduce an overrepresentation of participants with a relatively good prognosis, participants with breast cancer and prostate cancer were purposefully recruited. Participants had to be older than 18 years, able to complete a Dutch questionnaire and understand the objective of the study. The study protocol

was presented to the Medical Ethical Committee of the Dutch Cancer Institute (NKI) in Amsterdam, the Netherlands (METC17.1491), and was declared exempt from ethical review. Informed consent was obtained from all patients for being included in the study.

2.2 | Measures

2.2.1 | Sociodemographic and clinical characteristics

Age, gender, marital status, education, religious affiliation, and comorbidities were self-reported (Table 1).

TABLE 1 Sociodemographic and clinical characteristics of patients with advanced cancer ($N = 400$)

Variable	Category/subscale	N (%) / mean (SD), range	
Age		64.4 (9.8), [31–88]	
Gender	Male	208 (52%)	
	Female	192 (48%)	
Marital status	Married/partnered	346 (87%)	
	No partner	54 (14%)	
Education	High school or less	107 (27%)	
	Vocational	168 (42%)	
	University degree	125 (31%)	
Religious affiliation	Protestant or catholic, not churchgoing	164 (41%)	
	Protestant and catholic, churchgoing	75 (19%)	
	Other or no affiliation ^a	161 (40%)	
Comorbidities	0	142 (36%)	
	1	157 (39%)	
	2 or more	101 (25%)	
FACIT-Sp-12	2 factors	Meaning/peace	22.1 (5), [3–32]
		Faith	5 (4.3), [0–16]
	3 factors	Meaning	12.5 (2.8), [2–16]
		Peace	9.6 (3.2), [0–16]
		Total	27.2 (7.6), [3–48]
EORTC-QLQ-C30 (version 3)	Global health status/QoL	69.1 (18.6), [8–100]	
	Physical functioning	72 (21.4), [0–100]	
	Role functioning	65.5 (28.7), [0–100]	
	Emotional functioning	79.4 (19.4), [8–100]	
	Cognitive functioning	83.5 (19.7), [0–100]	
	Social functioning	79.7 (22.7), [0–100]	
	Fatigue	37.2 (23.7), [0–100]	
	Pain	20.6 (24.3), [0–100]	

Abbreviations: EORTC-QLQ-C30, European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-C30; FACIT-Sp-12, Functional Assessment of Chronic Illness Therapy–Spiritual Well-Being 12; QoL, quality of life.

^aOther or no affiliation includes no affiliation ($N = 147$), humanist ($N = 10$) and other ($N = 4$).

TABLE 3 Results of confirmatory factor analysis using SEM^a

Model	Satorra–Bentler scaled χ^2 (df)	RMSEA (90% CI)	AIC	BIC	TLI_SB	CFI_SB	SRMR
Model 1							
2-factor	278.61 (53)***	0.110 (0.099–0.122)***	12,154	12,301	0.872	0.897	0.088
Model 2a							
3-factor	134.92 (51)***	0.070 (0.057–0.083)**	11,998	12,153	0.950	0.962	0.075
Model 2b							
Adjusted Model 2a with correlated error covariance for reverse-worded items	122.87 (50)***	0.065 (0.052–0.079)**	11,985	12,145	0.956	0.967	0.073
Model 2c							
Adjusted Model 2b with correlated error covariance for Items 1 and 4	114.11 (49)***	0.063 (0.049–0.076)	11,977	12,141	0.960	0.970	0.071
Model 2d							
Adjusted Model 2c with path from Peace to Item 12 added	73.78 (48)***	0.042 (0.025–0.057)	11,935	12,102	0.984	0.988	0.041
Model 3							
3-Factor model with Items 4, 8, and 12 removed	38.23 (24)*	0.045 (0.023–0.066)	8512	8631	0.989	0.993	0.030

Abbreviations: AIC, Akaike information criteria; BIC, Bayesian information criteria; CFI, comparative fit index; CI, confidence interval; RMSEA, root mean squared error of approximation; SRMR, standardized root mean squared residual; TLI, Tucker–Lewis index.

^aValues for good fit: RMSEA cut-off <0.08; TLI and CFI cut-off >0.95; SRMR cut-off <0.08.

* $p < 0.05$, ** $p < 0.005$, *** $p < 0.001$.

Internal reliability of the final scale was assessed using Cronbach's α coefficient.³⁶ To assess convergent validity between the FACIT-Sp-12 and the EORTC-QLQ-C30, we used Spearman's ρ and partial correlations to control for overlap with other factors. Data were analyzed using the statistical software STATA.³⁷

3 | RESULTS

3.1 | Patient characteristics

Participant characteristics are reported in Table 1. The sample had an average age of 65 years and consisted of slightly more men (52%). The majority (87%) were married or had a partner. Approximately a quarter (27%) had no more than a high school education, 42% had a vocational degree, and 31% a university degree. A fifth (19%) indicated to be churchgoing, either to the Protestant or Catholic church, 41% reported being Christian or Catholic but not attending church, 40% reported another or no affiliation.

Patients had a mean score of 27.2 (SD: 7.6) on SWB, which indicated that they felt somewhat well (range: 3–48; 48 would indicate best possible SWB). The mean QoL score for global health status/QoL was 69.1 (SD: 18.6; range: 8–100; 100 indicates best possible health/QoL). The mean score for physical functioning was 72 (SD: 21.4; range: 0–100; 100 indicates best possible functioning), falling below the threshold of 83 so indicating a clinically important problem³⁸; symptom burden was relatively low with 37.2 (SD: 23.7)

for fatigue, and 20.6 for pain (SD: 24.3; range: 0–100; 100 indicates a high level of symptom burden), not reaching the threshold for a clinical important problem.

3.2 | Item reduction analysis

The item-to-total correlations were all acceptable ($r \geq 0.30$), except for the reversed Items 4 and 8 ($r = 0.16$ and 0.26 , respectively; Table 2). Interitem correlation analyses showed that the Meaning items had fairly ideal correlations to each other. The lowest correlation was between Items 3 and 8 ($r = 0.21$) and the highest between Items 2 and 6 ($r = 0.60$), just above the cut-off value. The Meaning items showed substantial correlations with the Peace items, ranging from $r = 0.21$ between Items 4 and 8, to $r = 0.56$ between Items 5 and 7. Only Item 4 (which was reversed) seemed clearly distinct from Items 2, 3, and 5 ($r = 0.02$, 0.02 , and 0.08 respectively).

The correlations between the Peace items ranged from $r = 0.20$ between Items 4 and 6, to $r = 0.52$ between Items 1 and 7, with the exception of $r = 0.79$ for Items 6 “I am able to reach down deep inside myself in order to feel comfort” and 7 “I feel a sense of harmony in myself,” indicating potential redundancy.

For the Faith items, only Item 12 “I know that whatever happens with my illness, things will be okay” showed acceptable correlation to the other Faith items, with r ranging from 0.31 to 0.40. The correlations between the Items 9, 10, and 11 far exceeded the cut-off, suggesting redundancy. Particularly Items 9 and 10 seemed to be

highly similar ($r = 0.93$). The Faith items showed low correlations to the Meaning items, ranging from $r = 0.00$ (between Items 8 and 12) to $r = 0.26$ (between Items 3 and 12), and to the Peace items, ranging from $r = -0.01$ (between Items 4 and 10) to $r = 0.39$ (between Items 6 and 12).

3.3 | Confirmatory factor analysis

To compare the two- and three-factor models, a CFA was conducted (see Table 3). The χ^2 values for all models were statistically significant, suggesting poor fit. The RMSEA, TLI, and CFI values showed a good fit for Models 2a to 2d. The AIC, BIC, and SRMR suggested 2d as the best model. This model is presented in Figure S1. We performed additional CFA's in which we in turn removed Items 4 and 6–12 based on the item reduction analysis, and a low loading of 0.40 of Item 12 in the CFA (see Table S1). Model 3 with Item 4, 8, and 12 removed showed the best fit.

3.4 | Reliability

Cronbach's α coefficient for the full FACIT-Sp-12 was good with 0.82. For the subscale Meaning/Peace the coefficient was also good (0.80), and acceptable for Meaning (0.71) and Peace (0.73). The coefficient for Faith was good with 0.86. When Items 4, 8, and 12 were removed the Cronbach's α coefficient for the full scale increased to 0.83, and for the subscales to 0.84 for Meaning/Peace, 0.76 for Meaning, 0.81 for Peace, and 0.93 for Faith. The removal of the items with high correlations did not improve the Cronbach's α coefficient.

3.5 | Convergent validity

Finally, associations between the total score and three-factor structure of the FACIT-Sp-12 and the EORTC-QLQ-C30 are presented in Table 4. The total score correlated significantly with all the subscales of the EORTC-QLQ-C30 ($p < 0.001$). The majority of the correlations was due to the subscales Meaning and Peace that correlated significantly to all the subscales ($p < 0.001$). The factor Faith was correlated to global health/QoL ($p < 0.05$) and emotional functioning ($p < 0.05$). As hypothesized, correlations between QoL and Meaning and Peace were higher than the correlations between QoL and Faith.

4 | DISCUSSION

In our examination of the Dutch translation of the FACIT-Sp-12 we found some acceptable but also some problematic items in patients with advanced cancer in the secularized context of the Netherlands. The item reduction analysis indicated good item-to-total correlations for most items, except for the reversed Items 4 and 8. The interitem analysis also showed acceptable correlations for most items, except for Items 6 and 7, and Items 9, 10, and 11 suggesting redundancy. The CFA indicated a good fit for the three-factor structure. After performing additional CFA's with removing in turn the problematic items, and Item 12 showing a low loading, we settled for a factor structure with Items 4, 8, and 12 removed. The Cronbach's α coefficient was acceptable for the complete scale, but better for the scale with the same items removed. Removing these items did not solve the problem of redundancy, however, removing the redundant items caused the subscales to become too small and did not improve the fit nor the α coefficient. The scale showed

TABLE 4 Correlations (Spearman) of the FACIT-Sp-12 and EORTC-QLQ-C30

		FACIT-Sp-12			
		Total ^a	3 Factors		
EORTC-QLQ-C30 (version 3)			Meaning	Peace	Faith
Global health status/QoL		0.43***	0.46***	0.49***	0.11*
Functional scales	Physical functioning	0.19***	0.27***	0.29***	-0.05
	Role functioning	0.33***	0.31***	0.40***	0.10
	Emotional functioning	0.40***	0.32***	0.57***	0.10*
	Cognitive functioning	0.25***	0.24***	0.29***	0.08
	Social functioning	0.22***	0.22***	0.32***	0.03
Symptom scales	Fatigue	-0.27***	-0.26***	-0.40***	-0.02
	Pain	-0.21***	-0.22***	-0.28***	-0.01

Abbreviations: EORTC-QLQ-C30, European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-C30; FACIT-Sp-12, Functional Assessment of Chronic Illness Therapy—Spiritual Well-Being 12; QoL, quality of life.

^aBivariate correlation (Spearman's ρ).

* $p < 0.05$, ** $p < 0.005$, *** $p < 0.001$.

adequate convergent validity with QoL items of the EORTC-QLQ-C30.

The results of this study are comparable to results of other studies testing the FACIT-Sp-12 listed in the introduction. First, four other studies also raised concerns about the reversed items.^{9,16,19,20} Second, Item 12 showed unspecific loadings in other studies, sometimes loading on Meaning, sometimes on Peace, and sometimes on no scale at all.^{9,13-15,19,20,31} Murphy et al.⁹ suggested replacing this item with "My faith or spirituality has helped me through my cancer experience," showing a better model fit. Third, three other studies also found high correlations between Items 6 and 7 and Items 9 and 10.^{14,15,31} We propose that removing or replacing Items 4, 8, and 12 will mean an improvement for the Dutch scale. Furthermore, Items 6 or 7, and Items 9, 10, or 11, could benefit from a more in-depth analysis into why Dutch patients understand these items in a similar way, and if replacing them could add more depth and variety to assessing SWB.

This study further confirms a three-factor structure of the FACIT-Sp-12. Kørup et al.¹⁹ stratified their sample of Danish cancer survivors and found that a three-factor structure best suited the young and middle-aged groups, and a two-factor structure the elderly group. Since the Meaning and Peace subscales in this study showed substantive correlations, future studies could investigate if there is also a difference to be found for Dutch patients of various age groups.

Canada et al.³¹ concluded that because the scores of the three subscales can have such different associations with other measures, the total score is functionally useless. This study underwrites their conclusion if you look at the different associations of the different subscales to QoL. Note that Visser et al.³⁹ draw attention to overlap between the FACIT-Sp-12 and QoL, so correlations should be interpreted with care because they might be tautological. In this study, the high correlations between Peace and emotional functioning could point towards such an overlap.

Finally, to answer the question as to whether the FACIT-Sp-12 performs differently in a highly secular context such as the Netherlands, the results of this study indicate no major differences regarding problematic items, factor structure, reliability, and validity. On the other hand, there is a high correlation between three of the four items of the subscale Faith, indicating this subscale does not function well to measure the concept faith. Also, the mean Faith score of 5 (*SD*: 4.3) in this sample is much lower than scores reported in other samples with patients with cancer. Rabitti et al.¹³ for example, report a mean of 9.7 for terminal cancer patients. Unfortunately, studies do not always indicate the religiousness of their sample, so further comparisons are difficult to make. However, if we assume the sample of Monod et al.⁸ is fairly similar with regard to affiliation (in Switzerland, the unaffiliated form the largest "faithgroup"⁴⁰), the Dutch mean is still lower to their 8.1. This points to the possible conclusion that the Faith items are not meaningful in the Dutch context.

4.1 | Study limitations and future research

The generalizability of this study may be limited because the sample is a convenience sample of volunteers. Also, we were not able to investigate the face validity of the scale to assess, for example, whether patients understood the questions or what secular patients were thinking when they responded to the items in the Faith subscale. A qualitative approach would have helped to discern the overlap between the redundant items indicated above. Furthermore, for criterion and convergent validity we were limited to the measures available in the data. Future research could study convergent validity with more related measures, such as EORTC-QLQ-SWB32. Finally, the data did not allow a test-retest, measurement error and responsiveness analysis. Future research could focus on these limitations, and on a more in-depth analysis by stratifying age groups (see Kørup et al.¹⁹) or affiliations.^{10,20}

4.2 | Clinical implications

Our analysis of the FACIT-Sp-12 revealed serious questions about three items and concerns about the Faith subscale. Some redundant items limit the conceptual elaborateness of the scale. Therefore, since the results of the FACIT-Sp-12 provide limited information regarding SWB in the Netherlands, we recommend using other validated Dutch measures (e.g., the EORTC-QLQ-SWB32). When using the FACIT-Sp-12, we emphasize interpreting the problematic items and the Faith subscale with care. A future study could look into possible replacements for items. Finally, SWB is associated with QoL, with distinctive associations between the subscales Meaning, Peace, and Faith. A growing body of evidence indicates that SWB is an important dimension of care and should be integrated into patient care, for example, through spiritual assessments or collaborations with chaplains.

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CONFLICT OF INTEREST

The authors declare no conflict of interests.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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