Thyroid Cancer-Specific Health-Related Quality of Life Questionnaire: Psychometric Properties of the Persian Version

Abstract

Background: Adverse effects related to treatment negatively affect the quality of life of patients with thyroid cancer. The current study aimed to evaluate the psychometric properties of the Persian version of the thyroid-cancer-specific health-related quality of life (TC-specific HRQoL) questionnaire among patients with thyroid cancer in Kerman province, Iran. **Methods:** This research was a cross-sectional study conducted on 240 patients with thyroid cancer in Kerman province from 2000 to 2015. The patients were selected through the census method and were asked to complete the thyroid-cancer-specific quality of life questionnaire. Data were analyzed by SPSS version 19.0 and LISREL version 8.80. The reliability of the Persian version was determined by Cronbach's α coefficient and the intraclass correlation coefficient (ICC). Exploratory and confirmatory factor analysis (CFA) was also conducted. **Results:** The Cronbach's a and ICCs were determined as 0.92 and 0.88, respectively. Five factors were extracted in the exploratory factor analysis with a total of 55.76% explained variance. Acceptable goodness of fit indices were found in CFA. **Conclusions:** The Persian version of the TC-specific HRQoL has sufficient psychometric properties and can be used to assess HRQoL among patients with thyroid cancer.

Keywords: *Iran, quality of life, reproducibility of results, surveys and questionnaires, thyroid neoplasms*

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Introduction

Endocrine cancers are relatively rare, and thyroid cancer is the most common type of these malignancies (1% of all new cancers).[1] It is 2.5 times more prevalent in females than in males.[1,2] According to Safavi *et al*., from 2004 to 2010, the incidence rate of thyroid cancer was 2.20 per 100,000 persons in Iran, with a female-to-male sex ratio of 2. The study results indicated an increase in incidence of thyroid cancer during the 7-year period,[3] which is in line with the global rise in thyroid cancer incidence.

The 5-year survival rate of thyroid cancer was about 97% in 2007, indicating a high long-term survival rate.[4] Increase in survival is not the only purpose of cancer treatment, and one other important objective is providing a better quality of life.[5] The disease itself and the related treatment and follow-up procedures potentially affect health-related quality of life (HRQoL) in survivors.[2] Therefore, it is recommended that HRQoL be assessed

in cancer survivors so as to provide a good view of the patient's subjective experience of cancer and its related procedures.[5] It has been revealed that thyroid cancer survivors have decreased HRQoL in comparison to the general population.[6-8] Literature has revealed that some factors such as age below 45, scar problems, dysphonia, dysphagia, and also financial distress negatively affect quality of life among thyroid cancer survivors, and the suitable assessment, management, and prevention of these effects have been recommended.[9,10]

To date, several instruments have been developed to assess quality of life in patients with cancer. Some of these tools are more general, such as the European Organization for Research and Treatment of Cancer quality of life questionnaire (EORTC QLQ-C30), and others such as the thyroid-cancer-specific quality of life (THYCA-QoL) questionnaire, developed in 2013, are specifically designed for particular cancers.[4,7]

The current study was conducted to evaluate the psychometric properties of the Persian version of thyroid cancer-specific

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health-related quality of life (TC-specific HRQoL) questionnaire among patients with thyroid cancer in Kerman Province, Iran.

Methods

Settings and design

This research was a cross-sectional study conducted in Kerman Province, southeast Iran. Our statistical population included all patients with thyroid cancer who referred to one of the endocrinology offices in Kerman province from 2000 to 2015, which was the preferred referral center for thyroid cancer patients in our province.

Subjects

The patients were selected through the census method. Patients were contacted at least twice to complete the thyroid-cancer-specific quality of life (THYCA-QoL) questionnaire. Completion of questionnaires was preferably done in person, but participants were contacted by phone if that was not possible. In case the patient had trouble reading or was illiterate, the questionnaire was completed through an interview. Oral consent was obtained from all patients before completing the questionnaire.

Instrument

The original version of the THYCA-QoL is a 24-item thyroid-cancer-specific questionnaire developed for assessing the HRQoL of patients with thyroid cancer. It contains seven multi-item scales (neuromuscular, voice, concentration, sympathetic, throat/mouth, psychological, and sensory problems) and six single items (problems with the scar, chills, tingling in hands/feet, weight gain, headaches, and lowered sex drive). A specific time frame was considered (4 weeks for the sexual drive item and 1 week for all others). Each item was rated on a 4-point Likert scale, ranging from 1 ("not at all") to 4 ("very much"). A higher score on the symptom scale represented more complaints.[4,6,7,11] The original version of the THYCA-QoL questionnaire was translated into Persian separately by two professors who were highly qualified in English. By comparing the text of the two translations, a Persian version was prepared. The Persian version was translated into English by a translator who did not know the content of the

original questionnaire. The accordance of this version with the original questionnaire was assessed until a consensus was reached, and the final version was culturally adapted.

Data analysis

Data were analyzed by SPSS version 19.0 (SPSS Inc., Chicago, IL, USA) and LISREL version 8.80 (Scientific Software International, Chicago, IL, USA). The reliability of the Persian version was evaluated in a pilot study on 20 patients which then entered the study. Internal consistency was determined by the Cronbach's α coefficient, and test–retest was applied for a 2-week interval to calculate the intraclass correlation coefficient (ICC). Exploratory factor analysis was employed to determine the construct validity of the THYCA-Qi questionnaire (principal component analysis for extraction and oblimin with Kaiser normalization as rotation method). Also, confirmatory factor analysis (CFA) was conducted using fit measures including the goodness-of-fit index (GFI), adjusted GFI (AGFI), comparative fit index (CFI), root-mean-squared error of approximation (RMSEA), normed fit index (NFI), standard root mean square residual (SRMR), and Chi-square.

Ethical approvals

The study was approved by the research board at Kerman University of Medical Sciences (IR.KMU.1393.631). The anonymous questionnaires were completed voluntarily, and the participants were assured that the data would be used only for research purposes.

Results

In total, 240 patients with thyroid cancer participated in the current study (response rate: 80%). The majority (89.6%) were female with the mean age of 42.80 ± 13.85 years (minimum and maximum of 14 and 89 years, respectively). Table 1 shows the disease characteristics of the participants.

The mean score of quality of life was 48.40 ± 13.43, with a minimum and maximum of 24.0 and 90.0, respectively.

The internal consistency of the THYCA-Qi questionnaire determined by Cronbach's α coefficient was 0.92. In test–retest reliability, the ICC was 0.88.

Table 1: Disease characteristics of the patients with thyroid cancer

Characteristics		*n* (%)	Characteristics		*n* (%)
The severity	T1	76 (31.7)	Metastasis	M0	23 (9.6)
	T2	83 (34.6)		M1	22 (9.2)
	T3	18 (7.5)		MX	195 (81.2)
	T4	14 (5.8)	The stage	1	133 (55.7)
	Unknown	49 (20.4)		2	25 (10.4)
Lymph node involvement	N0	50 (20.8)		3	13 (5.4)
	N1	78 (32.5)		4	18 (7.35)
	NX	112 (46.7)		Unknown	51 (21.3)
Duration of the disease Mean (SE)		5.14 (0.37)	Tumor size Mean (SE)		2.32 (0.13)

The Kaiser–Meyer–Olkin (KMO) measure was 0.9, and Bartlett's test of sphericity was statistically significant ($P < 0.01$, $\chi = 2165.727$, df = 0.276). These results indicated proper correlation of factors, adequacy of sampling, and justifiability of factor analysis. After extraction, five factors had an eigenvalue higher than 1.00. The total amount of variance explained by these five factors was 55.76% (32.97, 7.86, 5.63, 5.03, and 4.25, respectively).

The first factor included items 1, 8, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 24, 25, 26, and 28. The second factor included items 2, 3, 4, 5, and 7, and the fourth factor contained items 9 and 10. The third (item 30) and fifth (item 17) factors had only one item [Table 2]. Cronbach's α coefficient was determined as 0.9, 0.65, and 0.69 for the first, second, and fourth factors, respectively. This coefficient was 0.90 for the whole questionnaire.

CFA was applied to compare the goodness of fit measures in the five-factor (our version) and the seven-factor (the original version) models [Table 3].

Discussion

The current study aimed to determine the psychometric properties of the Persian version of the TC-specific HRQoL questionnaire.

Cronbach's α coefficient and the intraclass correlation index indicated excellent reliability[12] in the Persian version. In the original version "Cronbach's alpha coefficients range from 0.45 to 0.82, and four of the seven subscales scored higher than the preferred 0.70 level."[4] In the Korean version of the questionnaire, Cronbach's α coefficient ranged from 0.54 to 0.82.[7] These findings indicate that the Persian version showed better internal consistency compared to others.

Both KMO measure and Bartlett's test indicated good partial correlation among items. The KMO measure was reported as 0.84 in the original questionnaire.[4] We extracted five factors in exploratory factors analysis, while the original[4] and Korean versions[7] of the instrument found seven factors along with six single items. This discrepancy may be due to differences in disease-related characteristics among patients participating in various studies. In CFA, both models had acceptable goodness of fit indices, indicating good construct validity in the instrument.

Altogether, our study revealed that the Persian version of TC-specific HRQoL had sufficient validity and reliability; therefore, it can be used to assess HRQoL among patients with thyroid cancer in clinical settings.

The current study revealed that the mean score of quality of life was moderate; therefore, appropriate interventions are necessary so as to improve quality of life. According to the sufficient psychometrics of the Persian version, TC-specific HRQoL can help clinicians promptly address factors that negatively affect patients' quality of life.

However, the current study was cross-sectional, which means it was not able to specify the time sequence. Also because of the specific characteristics of the statistical population in our study, the generalizability of the results should be considered with caution.

Conclusion

The Persian version of the TC-specific HRQoL has sufficient psychometric properties and can be used to assess HRQoL among patients with thyroid cancer.

Acknowledgments

Table 2: Exploratory factor loading of the TC-specific HRQoL questionnaire

n	Items	Pattern matrix		n	Items	Pattern matrix	
		Factor number	Factor loading			Factor number	Factor loading
1	Dry mouth	1	0.47	16	Feeling slowed down	1	0.69
2	Swallowing Problems	2	0.49	17	Weight gain	5	0.66
3	Hoarseness	2	0.56	18	Eye problems	1	0.54
4	Weak voice	2	0.69	20	skin problems	1	0.68
5	Lump in throat	2	0.66	21	Palpitations	1	0.60
7	Bothering scar on the neck	2	0.63	22	headaches	1	0.52
8	chills	1	0.47	23	Abrupt tiredness	1	0.72
9	Sensitive heat	4	0.71	24	Difficulty thinking	1	0.73
10	Hot flushes	4	0.82	25	Attentional problems	1	0.72
11	Pain in muscles/joints	1	0.53	26	Restlessness	1	0.75
12	Tingling in hands/feet	1	0.63	28	Anxiety	1	0.60
15	Cramps in legs	1	0.81	30	Sex drive	3	0.79

Table 3: The comparison of goodness of fit indices in the five-factor and seven-factor models

Model	χ^2/ df	SRMR	RMSEA (CI 95%)	GFI	AGFI	NFI	CFI
Five-factor	1.89	0.06	0.06 (0.05-0.07)	0.87	0.84	0.93	0.96
Seven factor	1.90	0.05	0.05 (0.04-0.07)	0.90	0.83	0.95	0.97

Conflicts of interest

There are no conflicts of interest.

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