

Development and Validation of a Thyroid Cancer-Specific Health-Related Quality of Life Questionnaire for Adult Filipinos with Differentiated Thyroid Cancer

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Abstract

Objectives. The study aims to develop and validate a health-related quality of life (HRQoL) questionnaire for adult Filipinos with differentiated thyroid cancer (DTC) that can be used in combination with the European Organization for Research and Treatment of Cancer QLQ-C30 Questionnaire.

Methodology. The study had 4 phases. Phase I involved generation of HRQoL issues from literature review, focus group discussions with 6 DTC patients and 5 health care professionals (HCP). Subsequent assessment for relevance and importance of the HRQoL issues by 20 patients and HCP panel was done. Phase II was formulation of the HRQoL issues into questionnaire and subsequent translation into Filipino. Phase III was pilot testing of the questionnaire in 15 patients. Phase IV was validation of the pre-final questionnaire in 231 patients.

Results. In Phase I, 28 HRQoL issues were generated. In Phase II, a 28-item Filipino questionnaire was created. In Phase III, 22 items that were not upsetting or confusing to patients and with good range of responses were retained. After Phase IV, a 22-item questionnaire with 5 conceptual scales (perceived fears, psychological distress/anxiety, functionality, voice complaints, neck complaints) was created.

Conclusion. The developed and validated 22-item questionnaire can be used to assess HRQoL issues in adult Filipinos with DTC.

Key words: thyroid cancer, quality of life, questionnaire, Philippines, validation studies

INTRODUCTION

The incidence of thyroid cancer has continuously increased in the last three decades all over the world.¹ In the Philippines, the incidence has been stable, with an annual average increase of 0.4% and 1.6% in males and females, respectively, as of 2002.² High survival rates (five-year survival rates around 98.1% from 2006-2012 in the US) account for the growing number of thyroid cancer survivors.³

The treatment of thyroid cancer is particularly effective in early stage disease and involves surgery (total thyroidectomy or lobectomy with or without lymphadenectomy), which is usually followed by radioiodine ablation therapy and suppressive doses of levothyroxine. These treatment modalities, however can be associated with physical or psychological complaints as

shown in studies by Almeida et al.,⁴ Rubic et al.,⁵ and Gomez et al.,⁶ which revealed radioactive iodine-related complaints like problems in swallowing, hypothyroid symptoms such as fatigue and negative effects on psychological well-being in patients with thyroid cancer. Moreover, the disease can recur even after several decades or persist for years requiring treatment. Therefore, long term follow-up is needed which can also lead to psychological distress. All of these factors could significantly alter the health-related quality of life (HRQoL) of thyroid cancer patients.

HRQoL is defined by the World Health Organization as a subjective perception of health in terms of physical, mental, and social well-being of a patient.⁷ Assessment of HRQoL in thyroid cancer patients can reveal the significant concerns of the patients relating to the disease. There are several studies assessing the HRQoL of thyroid

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cancer patients. Husson et al., systematically reviewed the literature on HRQoL of thyroid cancer survivors yielding 27 studies. The review showed that thyroid cancer survivors generally have a similar or slightly worse HRQoL compared with the normative population. Some of the identified causes in decrease in HRQoL include mental problems like anxiety and depression, physical problems like hoarseness, fatigue, chills and tingling sensation and decrease in social functioning in thyroid cancer patients in comparison to normal people in some of the included studies.⁸ The studies, however, used general HRQoL questionnaires, which might not reveal specific thyroid cancer-related complaints or a non-validated thyroid cancer HRQoL questionnaire.

The European Organization for Research and Treatment of Cancer (EORTC) created a quality of life questionnaire (EORTC QLQ-C30) which is one of the most widely used questionnaires for assessing quality of life in patients with cancer. This was meant to be used with supplementary modules that evaluate HRQoL in specific diseases.⁹ No module currently exists specifically for thyroid cancer. The only validated thyroid cancer-specific HRQoL (THYCA-QoL) questionnaire was developed in a Dutch population of thyroid cancer patients by Husson et al., according to the methods of the EORTC Quality of Life group.¹⁰ Currently, there is no validated thyroid cancer-specific HRQoL questionnaire in the Philippines.

A HRQoL questionnaire specific for thyroid cancer patients that can be used together with the EORTC QLQ-C30 in the Philippines will be very helpful in assessing the areas in these patients' lives that need to be addressed by physicians to maintain and/or improve quality of life. Differences between populations in terms of culture, socioeconomic status and probably treatment practices in thyroid cancer are some of the reasons for developing a new questionnaire instead of just adapting a validated questionnaire from another country.

The aim of the study was to develop a thyroid cancer-specific quality of life questionnaire in combination with the core cancer quality of life questionnaire EORTC QLQ-C30 and validate its use for adult Filipinos with differentiated thyroid cancer.

METHODOLOGY

Study Designs

The first part of the research (Phases I-III) involved questionnaire development. The second part (Phase IV) was a cross sectional analytic study to validate the questionnaire developed in the previous phases.

Study Subjects

The study subjects were adult patients aged 19 years and above with well differentiated thyroid cancer (DTC) who

were recruited from the Philippine General Hospital, a tertiary hospital in Manila. The diagnosis of DTC was based on histopathology results after thyroidectomy with or without maintenance levothyroxine therapy. Subjects were only included after giving their informed consent to participate in this study.

Subjects were excluded if they satisfied any of the following criteria: presence of cognitive impairment; presence of severe/uncontrolled comorbid diseases (uncontrolled hypertension, uncontrolled diabetes mellitus, congestive heart failure, chronic obstructive pulmonary disease, cerebrovascular disease, myocardial infarction, chronic kidney disease); presence of another coexistent cancer; and being illiterate or unable to read and write.

The study protocol was submitted to the University of the Philippines Manila Research Ethics Board (UPMREB) Panel for ethics review and approval. Implementation of the study began after approval from UPMREB. All patient information was kept anonymous and confidential. There was no conflict of interest in this study.

Description of Study Procedure

The development of a thyroid cancer-specific HRQoL questionnaire was partially based on the EORTC Quality of Life Group Guidelines for Developing Questionnaire Modules.¹¹

Phase I: Preliminary Steps - Generation of Health-Related Quality of Life Components (Review of Literature, Focus Group Discussions with patients and expert panel)

Phase I was intended to generate a comprehensive list of relevant HRQoL issues for thyroid cancer patients. Literature searches were done in PUBMED and Google Scholar to identify all relevant HRQoL issues. Existing, relevant questionnaires were also reviewed. A list of all questionnaires identified and finally a list of all potentially relevant HRQoL issues were then created.

A focus group of subjects with differentiated thyroid cancer [with representatives from the different types of differentiated thyroid cancer (i.e., papillary and follicular thyroid cancer), from the different stages of the cancer, from age groups <45 and 45 or greater, and from patients <10 years and 10 or more years from diagnosis] was formed in order to discuss relevant HRQoL issues related to their disease. The researcher asked the patients to describe their experiences and showed them existing HRQoL issues from the literature review during the discussion to determine their opinions regarding them. The interviews continued until no new issue was raised. Issues raised during the discussion that were not found in the initial list were added.

The provisional list of issues was then evaluated by an expert panel of health care professionals to assess aptness

of content and broadness of coverage. Five health professionals (2 endocrinologists, 1 otorhinolaryngologist-head and neck surgeon, 1 nuclear medicine specialist, 1 general surgeon with specialty in head and neck surgery) were included in the panel. The specialists were asked to identify the issues that, in their opinion, affect patients' HRQoL most profoundly and check if there were any missing HRQoL complaints. Additional issues based on the discussion were added to the list.

The health care providers and a sample of thyroid cancer patients [with representatives from the different types of differentiated thyroid cancer (i.e., papillary and follicular thyroid cancer), from the different stages of the cancer, from age groups <45 and 45 or greater, and from patients <10 years and 10 or more years from diagnosis] not involved in the focus group discussion were then asked to rate the issues from 1 (not relevant for thyroid cancer patients) to 4 (very relevant for thyroid cancer patients) on a Likert scale (relevance rating) and to select at the most 25 issues which they thought must be included in the questionnaire (priority rating).

Issues with high relevance ratings (mean score ≥ 1.5) and high priority ratings for inclusion in the module (ratings $\geq 25\%$), based on the recommendations by EORTC¹¹ and the study by Husson et al.,¹⁰ for both health care providers and thyroid cancer patients were included in the final list of issues. Issues that were already present in the EORTC QLQ-C30 questionnaire, and those that were upsetting to patients were excluded.

Phase II: Construction of the Draft Questionnaire

The final list of HRQoL issues from Phase I was then structured into questions similar in format with the EORTC QLQ-C30 (response categories: 'not at all,' 'a little,' 'quite a bit' and 'very much'). Issues which had been formed into question items in previous EORTC modules were used for uniformity of the questionnaire using the EORTC QoL Item Bank with permission from the authors. For the items that are unavailable in the EORTC Item Bank, new questions were constructed. The questions were created as clear, brief and unambiguous as possible.

The resulting provisional list of items were reviewed for clarity and overlap by the panel of health care professionals and a social scientist, after which the pre-final questionnaire was translated into Filipino for use in the pre-testing phase.

The translation was conducted by two translators who were native speakers of Filipino who have high level of fluency in English. They independently translated the questionnaire into Filipino. The first and the second translators' versions were merged into one single forward translation by the primary investigator. Then two translators translated the questionnaire from the provisional forward translation back into English. The two

English back-translation versions were checked by the primary investigator for consistency.

Phase III: Pilot Testing of the Draft Questionnaire

The final list of questions after Phase II was then pretested in a small number of patients with differentiated thyroid cancer [with representatives from the different types of differentiated thyroid cancer (i.e., papillary and follicular thyroid cancer), from the different stages of the cancer, from age groups <45 and 45 or greater, and from patients <10 years and 10 or more years from diagnosis] who were not involved in Phase I, after completing the EORTC QLQ-C30, to determine problems relating to the construction and comprehensibility of items. Interviews were conducted with the patients after completion of the questionnaire to ensure completeness and acceptability of the items in the list. The time it took study subjects to answer the questionnaire was recorded.

At this stage in Phase 3, a selection process which was determined beforehand was applied to remove unnecessary items. The following cut-off points were used for selection of items for retention in the final module: mean Likert scale score >1.5 , prevalence ratio $>30\%$, range >2 points, no floor or ceiling effect: responses in categories 3 and 4 or 1 and 2 $>10\%$, no significant concerns expressed by patients (e.g., item is upsetting, ambiguous), compliance of at least 95% response to the item. Items that met five of the six criteria mentioned above were retained in the list while those that did not were excluded.

The final list of items based on the above criteria comprised the pre-final questionnaire.

Phase IV: Validation of the Pre-final Questionnaire

The resultant pre-final questionnaire was validated in a sample of well differentiated thyroid cancer patients (at least 10 patients per question item based on the recommendation by Nunnally¹²). These subjects included a diverse group of DTC patients [with representatives from the different types of differentiated thyroid cancer (i.e., papillary and follicular thyroid cancer), from the different stages of the cancer, from age groups <45 and 45 or greater, and from patients <10 years and 10 or more years from diagnosis], not involved in the previous phases of the study, from both charity and pay patients who consulted at the outpatient clinic or were admitted at the Philippine General Hospital. The subjects first completed the EORTC QLQ-C30 before answering the pre-final version of the questionnaire.

Data analyses included assessment of the response distributions for each item to examine central tendency and variability, and determine presence or absence of ceiling and floor effects; evaluation of construct validity using factor analysis; determination of scale structure using multi-trait scaling analysis; assessment of reliability using Cronbach's alpha coefficient; and ascertainment of correlation of the developed questionnaire with the EORTC QLQ-C30 utilizing Spearman correlation. Floor or

ceiling effect (when 80% of the responses fall in one response category) impairs the ability of investigators to determine the central tendency of the data, thus question items containing either of these were removed from the questionnaire.

RESULTS

Phase I

The literature search using the keywords: “quality of life,” “health-related quality of life,” and “complaints” in addition to “thyroid cancer” or “thyroid carcinoma” yielded 47 studies and two thyroid cancer specific questionnaires (1 validated in a Dutch population and another non-validated questionnaire). A total of 81 HRQoL issues were identified from the studies and questionnaires.

The focus group discussion involving 6 diverse thyroid cancer patients yielded 3 more HRQoL issues. Another 9 issues were added and 7 were removed based on discussion with the expert panel. Twenty-four issues were removed because they were already covered by the EORTC QLQ-C30. A total of 62 HRQoL issues remained. These were presented to the 5 health care professionals and 20 diverse thyroid cancer patients for relevance and priority ratings using an English and Filipino Likert scale rating and priority rating tables, respectively. Thirty-four issues were removed because of low relevance and low priority ratings. A total of 28 HRQoL issues relevant to thyroid cancer patients were retained (Appendix A).

Phase II

Four HRQoL issues were constructed into items using questions from the EORTC QoL Item Bank and the remaining 24 issues which were not found in the item bank, were constructed into new questions. These questions were then reviewed by the expert panel and a social scientist resulting in a pre-final list of questions (Appendix B). The time period for the health related complaints assessed by the EORTC QLQ-C30 questionnaire is one week. However, after discussion with the panel and thyroid cancer patients, it was decided to use one month for this study because it was felt that one week is too short for the HRQoL issues in patients with thyroid cancer.

Translation of the constructed questions from English to Filipino and then back to English was done. The Filipino forward translated version had good correlation with the initially formed English questionnaire.

Phase III

Pretesting was done on 15 thyroid cancer patients. Patients did not find any annoying, confusing, upsetting, intrusive or irrelevant questions. They also did not think there were missing items from the list. There were no identified problems with the phrasing of the questions. Patients

Table 1. Demographic data of subjects with differentiated thyroid cancer, N=231, Manila

Characteristic	Value
Age in years (Mean, SD)	47.67 (13.32)
Gender	
Male – n (%)	33 (14.3%)
Female – n (%)	198 (85.7%)
Educational attainment	
None – n (%)	1 (0.4%)
Elementary undergraduate – n (%)	12 (5.2%)
Elementary graduate – n (%)	42 (18.2%)
High school graduate - n (%)	119 (51.5%)
College graduate – n (%)	57 (24.7%)
Civil Status	
Single – n (%)	50 (21.6%)
Married – n (%)	155 (67.1%)
Widowed – n (%)	26 (11.3%)
Employment status	
Employed – n (%)	43 (18.6%)
Unemployed – n (%)	188 (81.4%)
Years since diagnosis (mean, SD)	5.05 (6.07)
Type of thyroid cancer	
Papillary – n (%)	204 (88.3%)
Follicular – n (%)	27 (11.7%)
Stage of cancer	
I – n (%)	131 (56.7%)
II – n (%)	46 (19.9%)
III – n (%)	29 (12.6%)
IV – n (%)	25 (10.8%)
Comorbidities	
None – n (%)	142 (61.5%)
Only 1 – n (%)	58 (25.1%)
2 or more – n (%)	31 (13.4%)
Treatment received	
Surgery only – n (%)	72 (31.2%)
Surgery & iodine-131 ablation – n (%)	157 (67.9%)
Surgery and radiotherapy – n (%)	2 (0.9%)

finished the questionnaire with an average time of 6 minutes, with a range of 3 to 9 minutes.

After Phase III of the study, 6 items were removed because of failure to meet 5 of 6 criteria for retention. The recommended number of items at the end of this phase is about 20. In this study there were 22.

Phase IV

Validation was done in 231 patients with DTC. Table 1 shows the demographic data of the subjects. Of the 231 participants, 33 (14%) were men and 198 (86%) were women. The mean age of participants was 47.67±13.32 years (range 19-79 years). Fifty (22%) were single, 155 (67%) were married, and 26 (11%) were widowed. They possessed varying degrees of formal education, with one having no formal education at all, 12 (5%) were elementary undergraduates, 42 (18%) were elementary graduates, 119 (52%) were high school graduates, and 57 (25%) were college graduates. Eighty-one percent was unemployed. Time since diagnosis of thyroid cancer ranged from 29 days to 42 years, with a mean time of 5.05±6.07 years. Two hundred four (88%) had papillary type of thyroid cancer and 27 (12%) had follicular type. The participants had different stages of cancer: 131 (57%) were stage 1, 46 (20%) were stage 2, 29 (13%) were stage 3, and 25 (11%) were stage 4. While 61% had no comorbidity, 25% had one and 13% had two comorbidities. All participants underwent surgery. Of these, two (0.87%) also had radiotherapy and 157 (68%) had iodine-131 ablation.

Table 2. Item descriptive statistics for the question items

Item	Description	% Respondents	Mean Score (SD)	Distribution of responses (%)			
				1	2	3	4
1	Neck pain	100	1.8 (0.9)	44	35	14	7
2	Lifetime meds	100	2.3 (1.0)	29	23	40	8
3	Limit Physical activity	100	2.2 (0.9)	29	33	30	8
4	Slowed down	99.6	2.0 (0.9)	35	35	24	6
5	Repeat RAI	98.7	2.3 (1.0)	26	28	31	15
6	Regular lab tests	100	2.0 (1.0)	38	34	19	9
7	Recurrence	99.1	2.8 (1.0)	13	17	43	27
8	Cold Intolerance	99.6	1.9 (0.9)	40	32	21	7
9	Treated differently	99.1	1.4 (0.7)	72	16	10	2
10	Relatives get cancer	99.6	2.6 (1.0)	18	26	39	17
11	Neck numbness	100	1.6 (0.9)	59	24	11	6
12	Reduced motivation	100	2.0 (1.0)	44	23	27	6
13	Repeat surgery	100	2.4 (1.0)	26	24	34	16
14	Weak voice	100	2.0 (1.0)	47	22	21	10
15	Another cancer	100	2.4 (1.0)	26	24	34	16
16	Hoarseness	97.0	1.8 (1.0)	53	25	14	8
17	Sudden tiredness	100	1.8 (0.9)	50	26	21	3
18	Muscle/joint pain	99.6	2.0 (1.0)	41	32	18	9
19	Weight gain	99.6	2.1 (1.0)	37	24	35	4
20	Future uncertainty	99.6	2.0 (0.9)	40	29	25	6
21	Isolation	99.6	1.5 (0.8)	71	14	11	4
22	Take LT4 before meals	100	1.6 (0.9)	68	12	14	6

Table 3. Factor loadings of the items after oblique rotation factor analysis

Item	Pattern Matrix				
	1	2	3	4	5
Factor 1: Perceived Fears					
Fear of repeat radioiodine ablation	0.7277				
Fear of recurrence	0.8170				
Fear of relatives getting cancer	0.6173				
Fear of repeat surgery	0.7526				
Fear of another cancer from radiation	0.6728				
Feeling of uncertainty of future	0.4139				
Factor 2: Psychological Distress/Anxiety					
Bothered by lifetime intake of levothyroxine		0.6106			
Bothered by belief in limitation of activity		0.6174			
Bothered by regular laboratory tests		0.5858			
Feeling of being treated differently		0.4292			
Feeling of isolation		0.5632			
Bothered by need to take levothyroxine 30 minutes to 1 hour before breakfast		0.6871			
Factor 3: Functionality					
Feeling slowed down			0.3931		
Reduced motivation			0.4295		
Sudden attacks of tiredness			0.6786		
Muscle/joint pain			0.7293		
Weight gain			0.6272		
Factor 4: Voice Complaints					
Weak Voice				0.8999	
Hoarseness				0.9043	
Factor 5: Neck Complaints					
Neck pain					0.8360
Neck numbness					0.7958

Data analyses were done after completion of Phase IV to determine which items to retain and which to exclude. Item descriptive statistics (Table 2) showed high valid responses and absence of floor or ceiling effects for all items. Thus, no item was excluded at this point in the study.

To assess construct validity, factor analysis was done. The suitability of the data for factor analysis was tested via the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. For a satisfactory analysis to proceed, the KMO value should be higher than 0.5. The KMO measure in the study was 0.89, thus factor analysis was done. Five factors were identified based on Cattell’s scree plot which states that an eigenvalue (the amount of the total variance explained by that factor) must be greater than one for a factor to be retained. Figure 1 shows that five factors have eigenvalues of at least 1 and were thus retained.

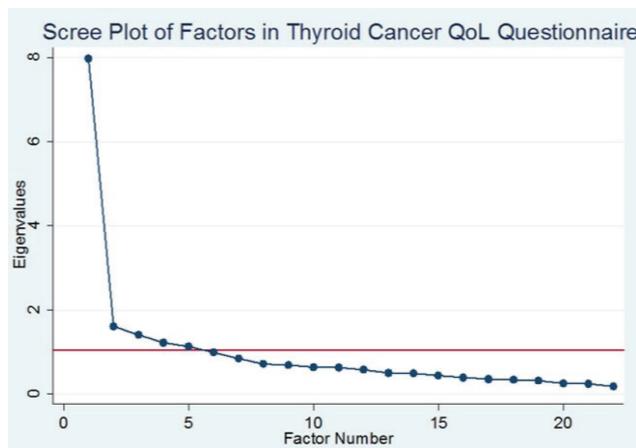


Figure 1. Scree Plot shows that five factors have eigenvalues of at least 1 which means that these five factors explain most of the variability in the data.

Table 4. Reliability, convergent validity, divergent validity of the 5 scales

Scale/Factor	Number of Items	Cronbach's alpha	Item-Scale Convergent Validity	Item-Scale Divergent Validity
Perceived Fears	6	0.85	0.503-0.748	0.154-0.540
Psychological Distress/Anxiety	6	0.80	0.390-0.646	0.023-0.540
Functionality	5	0.74	0.257-0.592	0.050-0.527
Voice Complaints	2	0.87	0.741	0.116-0.442
Neck Complaints	2	0.73	0.542	0.078-0.278

Table 5. Spearman correlations between EORTC QLQ-C30 and thyroid cancer HRQoL Questionnaire

EORTC	Factor 1 Perceived Fears	Factor 2 Psychological Distress / Anxiety	Factor 3 Functionality	Factor 4 Voice Complaints	Factor 5 Neck Complaints	Cold Intolerance
Global Health Function	-0.3488*	-0.3305*	-0.3861*	-0.2510*	-0.0820	-0.1654
Physical Function	0.4060*	0.4149*	0.5394*	0.3350*	0.1968*	0.3779*
Role Function	0.3138*	0.3752*	0.2775*	0.3324*	0.2116*	0.3616*
Emotional Function	0.4527*	0.4971*	0.3796*	0.2480*	0.1910*	0.2857*
Cognitive Function	0.3461*	0.3360*	0.4087*	0.2580*	0.2011*	0.2197*
Social Function	0.3991*	0.5444*	0.4027*	0.2441*	0.2545*	0.3194*
Fatigue	0.2966*	0.3576*	0.5825*	0.1935*	0.1632	0.3179*
Nausea/ Vomiting	0.1817*	0.1292	0.2004*	0.0992	0.2720*	0.1292
Pain	0.3500*	0.4653*	0.4411*	0.3061*	0.2199*	0.3597*
Dyspnea	0.2808*	0.3348*	0.3777*	0.155	0.3179*	0.2224*
Insomnia	0.1878*	0.1708*	0.2086*	0.0974	0.0429	0.0733
Appetite Loss	0.1379	0.2623*	0.2033*	0.041	0.1648*	0.2235*
Constipation	0.2687*	0.2693*	0.3794*	0.1783*	0.0657	0.2775*
Diarrhea	-0.0325	-0.0205	-0.0265	-0.0327	-0.0903	-0.0202
Financial Difficulty	0.3657*	0.4944*	0.3712*	0.2709*	0.1703*	0.143

*p<0.05

Oblique rotation to determine factor loadings of each item was done (Table 3). The items that had high factor loadings (>0.35) in the same factor were grouped together indicating that these items may reflect a related groups of symptoms or complaints. Factor 1 is defined by items relating to perceived fears of the patients. Factor 2 is composed of items relating to psychological distress or anxiety. Factor 3 includes items relating to functionality of patients. Factors 4 and 5 are items dealing with voice complaints and neck complaints, respectively. Some items had high item loadings in more than 1 factor but were assigned to the factor with the items they are more compatible with. The item for cold intolerance did not have high loading in any of the factors and thus was considered as a single item.

The reliability of the five identified factors or scales was assessed using Cronbach's alpha. Acceptable Cronbach's alpha is 0.7. The convergent and divergent validity were assessed using Spearman correlation. A value of >0.4 indicate moderate to high correlation while <0.4 indicate weak correlation. Items of the same scale should have moderate to high correlation or good convergent validity while items from different scales should have weak correlation or good divergent validity.

Cronbach's alpha reliability coefficients for the five factors range from 0.73-0.87. All are greater than the preferred cut-off of 0.7 which indicates good reliability. The overall Cronbach's alpha for the entire measure is 0.91. All the scales in general have good convergent and divergent validity with some exceptions (Table 4).

Furthermore, Spearman correlations between the various scales of the EORTC QLQ-C30 and the scales and items of the created thyroid cancer specific questionnaire were done. Most scales of the thyroid cancer HRQoL

questionnaire correlated poorly with the EORTC QLQ-C30 (Table 5).

DISCUSSION

This questionnaire was developed using the guidelines of EORTC, which is one of the largest questionnaire-making body for quality of life of cancer patients. Extensive literature search, and thorough interviews and consult with relevant health care professionals and thyroid cancer survivors were done to create a questionnaire that covers the multidimensional HRQoL issues in patients with DTC.

There were 5 factors or scales identified in this study. The scales all have good reliability and mostly good convergent validity (correlation of >0.4) with some exceptions in Factors 2 and 3 and good divergent validity (correlation of <0.4) with some exceptions in the 5 factors which may be explained by loading of some items in more than 1 factor. Thus, all the items were retained. Spearman correlation between the EORTC QLQ-C30 and the developed thyroid cancer questionnaire was weak which indicates that there is no redundancy between the two questionnaires. Thus, the developed and validated thyroid cancer HRQoL questionnaire can be used in combination with the EORTC QLQ-C30 for patients with DTC.

There are a few existing questionnaires specifically used in the assessment of HRQoL of thyroid cancer patients. The THYCA-QoL is a thyroid cancer HRQoL questionnaire developed and validated for the Dutch population.¹⁰ Jeong et al., also validated a Korean version of this questionnaire which was shown to be a reliable and valid assessment tool that can be used in combination with the EORTC QLQ-C30 to assess the HRQoL of Korean thyroid cancer patients.¹³ Most of the items in that questionnaire are related to physical complaints. In contrast, the results of this study

showed several psychological as well as functional HRQoL complaints in addition to physical complaints in Filipino patients. This study shows that differences in complaints or perception of a decrease in quality of life occur in different cultures of subjects with DTC.

Another thyroid cancer HRQoL questionnaire known as City of Hope Quality of Life – Thyroid version was developed in California, USA.¹⁴ However, it was not validated. It includes physical, psychological, social and spiritual components. EORTC is also currently developing a thyroid cancer specific HRQoL questionnaire which will be validated in the European population.¹⁵

Because of the usually good prognosis and prolonged life of thyroid cancer patients compared to other cancer patients, using the final questionnaire (see Appendix C for the Filipino and English versions of the final questionnaire) to assess their quality of life is of value for physicians to guide therapy. Care of these patients can be improved based on their perceived HRQoL.

CONCLUSIONS

A 22-item questionnaire to assess HRQoL specific for Filipinos with DTC that can be used in combination with the EORTC QLQ-C30 was developed and validated. Five scales (perceived fear, psychological distress/anxiety, functionality, neck complaints, voice complaints) with good reliability, and acceptable convergent and divergent validity were identified.

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Statement of Authorship

All authors have approved the final version submitted.

Author Disclosure

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Appendix A. Final list of HRQoL issues from Phase I of study

1. Weak voice
2. Neck numbness
3. Hoarseness
4. Neck pain
5. Feeling slowed down
6. Difficulty tolerating cold
7. Weight gain
8. Sudden attacks of tiredness
9. Skin problems like itchiness, dryness
10. Pain in muscles and/or joints
11. Difficulty coping with disease
12. Feeling of distress over regular laboratory tests
13. Bothered by need to take tablets for the rest of life
14. Fear of need of another radioactive iodine treatment
15. Feeling of not being in control of life
16. Feeling of uncertainty about future
17. Fear of recurrence of cancer/worsening of disease
18. Reduced motivation in daily activities
19. Feeling of dissatisfaction with life
20. Concern over limitation in activity – belief of “bawal magbuhat”
21. Fear of sterility from radioactive iodine treatment
22. Fear of another cancer from radiation
23. Fear that loved ones will also get thyroid cancer
24. Bothered by need to go to doctor regularly
25. Bothered by need to take tablets 30 minutes to 1 hour before breakfast
26. Fear of need of another surgery
27. Feeling of being treated differently due to disease
28. Feeling of isolation due to disease

Appendix B. List of constructed questions

- Have you noticed that you talked with a weak voice?
- Have you experienced numbness in your neck?
- Have you been hoarse?
- Have you experienced pain in your neck?
- Have you felt slowed down?
- Have you had difficulty tolerating cold weather?
- Have you gained weight?
- Have you had sudden attacks of tiredness?
- Have you had dry, itchy, flaky or puffy skin?
- Have you experienced aches or pains in your muscles or joints?
- Have you had difficulty coping with your disease?
- Have you felt distress over the need to undergo regular laboratory tests?
- Have you been bothered by the need to take medications for the rest of your life?
- Have you felt fear of needing another radiation?
- Have you felt that you had no control over your life?
- Have you felt uncertain about your future?
- Have you felt fear of recurrence of your cancer or worsening of your disease?
- Have you had reduced motivation in daily activities?
- Have you felt dissatisfaction with your life?
- Have you had concerns of limiting your physical activity because of your disease?
- Have you felt fear of sterility from radiation?
- Have you felt fear of developing another cancer from exposure to radiation?
- Have you felt fear that your loved ones will also get thyroid cancer?
- Have you been bothered by the need to go to the doctor regularly?
- Have you been bothered by the need to take levothyroxine tablets 30 minutes to 1 hour before breakfast?
- Have you felt fear of needing of another surgery because of your disease?
- Have you felt that you were being treated differently because of your disease?
- Have you felt isolated due to your disease?

Appendix C. Final Questionnaire after Phase IV

Filipino Version

Talatanungan Tungkol sa Kalidad ng Buhay ng Pasyenteng May Thyroid Kanser

Kami ay interesado sa iilang bagay tungkol sa iyo at iyong kalusugan. Pakisagot lamang po ang mga tanong sa pamamagitan na pagbilog sa bilang na tumutukoy sa iyo. Walang “tama” o “maling” sagot sa tanong. Ang impormasyon na iyong ibibigay ay mananatiling lihim.

Code Number: _____

Oras Nagsimula: _____

Iyong Kapanganakan (araw, buwan, taon): _____

Oras Natapos: _____

Kasalukuyang petsa: _____

Hindi – 1; Kaunti – 2; Medyo – 3; Madalas – 4

Sa nakaraang 30 araw:	Pakibilog ang iyong kasagutan			
	Hindi	Kaunti	Medyo	Madalas
Nakaramdam ka ba ng kirot sa iyong leeg?	1	2	3	4
Nabahala ka ba dahil kailangan mong uminom ng gamot habang-buhay?	1	2	3	4
May mga pag-aalala ka ba na dapat maglimita ka sa mga pisikal mong gawain dahil sa iyong sakit?	1	2	3	4
Nakaramdam ka ba ng pagbagal ng pagkilos?	1	2	3	4
Nakaramdam ka ba ng takot sa posibilidad na kailangang sumailalim ka sa isa pang radiation?	1	2	3	4
Nakaramdam ka ba ng balisa dahil kailangan mong sumailalim sa regular na laboratory tests?	1	2	3	4
Nakaramdam ka ba ng takot na umulit ang iyong kanser o lumala ang iyong sakit?	1	2	3	4
Nahirapan ka bang tiisin ang malamig na panahon?	1	2	3	4
Nakaramdam ka ba na naiba ang naging pagtrato sa iyo dahil sa iyong sakit?	1	2	3	4
Nakaramdam ka ba ng takot na ang iba mong mahal sa buhay ay magkaroon din ng kanser sa thyroid?	1	2	3	4
Nakaramdam ka ba ng pamamanhid sa iyong leeg?	1	2	3	4
Nabawasan ba ang iyong sigla para sa mga gawaing pang-araw-araw?	1	2	3	4
Nakaramdam ka ba ng takot na maaari kang operahan ulit dahil sa iyong sakit?	1	2	3	4
Napansin mo bang mahina ang iyong boses kapag ikaw ay nagsasalita?	1	2	3	4
Nakaramdam ka ba ng takot na magkaroon ng iba pang uri ng kanser mula sa radiation?	1	2	3	4
Namaos ka ba?	1	2	3	4
Nakaramdam ka ba ng pag-atake ng biglaang pagkapagod?	1	2	3	4
Nakaramdam ka ba ng pagkirot ng iyong mga kalamnan at kasu-kasuan?	1	2	3	4
Nadagdagan ba ang iyong timbang?	1	2	3	4
Nakaramdam ka ba ng kawalan ng kasiguruhan sa hinaharap mo?	1	2	3	4
Nakaramdam ka ba na ikaw ay nag-iisa dahil sa iyong sakit?	1	2	3	4
Nabahala ka ba dahil kailangan mong uminom ng levothyroxine tablets 30 minuto hanggang isang oras bago ka mag-almusal?	1	2	3	4

English Version

Thyroid Cancer-Specific Quality of Life Questionnaire

We are interested in some things about you and your health. Please answer all of the questions yourself by circling the number that best applies to you. There are no "right" or "wrong" answers. The information that you provide will remain strictly confidential.

Code Number: _____

Your birthdate (Day, Month, Year): _____

Today's date (Day, Month, Year): _____

Not at all – 1; A little – 2; Quite a bit – 3; Very much – 4

During the past 30 days:	Please encircle your answer			
	Not at all	A little	Quite a bit	Very much
Have you experienced pain in your neck?	1	2	3	4
Have you been bothered by the need to take medications for the rest of your life?	1	2	3	4
Have you had concerns of limiting your physical activity because of your disease?	1	2	3	4
Have you felt slowed down?	1	2	3	4
Have you felt fear of needing another radiation?	1	2	3	4
Have you felt distress over the need to undergo regular laboratory tests?	1	2	3	4
Have you felt fear of recurrence of your cancer or worsening of your disease?	1	2	3	4
Have you had difficulty tolerating cold weather?	1	2	3	4
Have you felt that you were being treated differently because of your disease?	1	2	3	4
Have you felt fear that your loved ones will also get thyroid cancer?	1	2	3	4
Have you experienced numbness in your neck?	1	2	3	4
Have you had reduced motivation in daily activities?	1	2	3	4
Have you felt fear of needing of another surgery because of your disease?	1	2	3	4
Have you noticed that you talked with a weak voice?	1	2	3	4
Have you felt fear of developing another cancer from exposure to radiation?	1	2	3	4
Have you been hoarse?	1	2	3	4
Have you had sudden attacks of tiredness?	1	2	3	4
Have you experienced aches or pains in your muscles or joints?	1	2	3	4
Have you gained weight?	1	2	3	4
Have you felt uncertain about your future?	1	2	3	4
Have you felt isolated due to your disease?	1	2	3	4
Have you been bothered by the need to take levothyroxine tablets 30 minutes to 1 hour before breakfast?	1	2	3	4

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