



## A STUDY ON HEALTH RELATED QUALITY OF LIFE IN PATIENTS WITH THYROID DISORDERS.

### Endocrinology

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### ABSTRACT

**BACKGROUND:** Thyroid diseases affect quality of life (QOL). The Thyroid-Related Patient-Reported Outcome (ThyPRO) is an international comprehensive well-validated patient-reported outcome, measuring thyroid-related QOL. The purpose of the present study was to know the effects of thyroid disorders on quality of life.

**METHODS:** A cross-sectional study (N = 100) of thyroid patients were analyzed. A graded item response theory (IRT) model was fitted to the cross-sectional data. Short-form scales with three items and Seven scales measuring mental and social well-being and function as well as one overall QOL impact item were analyzed in a bifactor model, to develop a supplementary composite score. The short and long form was estimated by agreement plots, intraclass correlations, and mean score levels. Responsiveness was compared by relative validity indices, clinical validity by ability to detect clinically relevant differences, and test-retest reliability by intra-class correlation.

**RESULTS:** A bifactor model with good overall fit was fitted to the composite score, including the single QoL item. Short- versus long-form intraclass correlations were high (0.89–0.98), and the mean scale levels were similar. Mood/behaviour disturbances were present in a large proportion of patients and were significantly associated with poor QOL.

**CONCLUSIONS:** A comprehended version of the questionnaire, with good measurement properties, was developed and is recommended for clinical use. QOL was significantly reduced in patients with thyroid diseases. Perceived health status may be considered as an additional outcome of management and therapy of thyroid disorders.

### KEYWORDS

Diseases related to the thyroid gland are common, affecting around 10–15% of the adult population in most countries<sup>1-3</sup>. Invariably, thyroid diseases affect quality of life (QOL)<sup>4,6</sup>, work role function<sup>7,8</sup>, as well as morbidity and mortality<sup>9,10</sup>. Moreover, research focusing on QOL among these patients has been scarce until recently.

The Thyroid-Related Patient-Reported Outcome instrument was developed as a comprehensive thyroid-related for patients with any thyroid disease<sup>11-13</sup>. The purpose of the present study was to develop an abbreviated version of the ThyPRO with good cross-cultural validity and with maximum preservation of favorable measurement properties in terms of construct and clinical validity, test-retest reliability, and responsiveness to relevant clinical treatments.

#### METHODS AND METHODOLOGY

**STUDY POPULATION:** Data from previously described patient populations were used<sup>14</sup>. The cross-sectional sample comprised thyroid patients followed at hospital outpatient endocrinology clinics of father muller hospital, managlore, Karnataka in 2016- 2018. This sample comprised patients with newly diagnosed thyroid disease, as well as patients controlled for ongoing treatment.

#### PATIENT-REPORTED OUTCOME MEASURE:

The ThyPRO measures a range of aspects of QOL relevant to patients with thyroid diseases, as identified during patient and expert interviews<sup>15</sup>. It covers both physical symptoms specifically relevant to thyroid diseases. The full-length ThyPRO consists of 85 items summarized in 13 scales, as well as a single item measuring overall impact of thyroid disease on QoL. Each item is rated on a 0–4 Likert scale from 0 = "no symptoms/problems" to 4 = "severe symptoms/problems." The average score of items in a scale is divided by four and multiplied by 100 to yield thirteen 0–100 scales, with higher scores indicating worse health status.

#### STATISTICAL ANALYSIS:

Descriptive analyses, summed-score linking, sensitivity tests, responsiveness comparisons, and test-retest intraclass correlations were performed with SPSS software<sup>16</sup>.

**TABLE 1: Results Analysis**

Goiter symptoms	SLOPE	1	2	3	4
Sense of fullness in neck	2.9	0.1	0.8	1.4	2.3
<b>Visible swelling in front of neck</b>					
Pressure in throat	3.7	0.1	0.8	1.3	2.2
Pain in front of neck	2.0	1.1	1.7	2.4	3.8
Throat pain felt in ears	1.3	1.2	2.2	3.1	4.4
Lump in throat	3.3	0.0	0.7	1.2	2.0
Clear throat often	1.7	0.2	0.7	1.4	2.5
Discomfort swallowing	3.5	0.4	1.0	1.5	2.3
Difficulty swallowing	2.9	0.7	1.4	1.8	2.5
Sense of suffocating	2.3	1.2	1.8	2.2	2.9
<b>Hyperthyroid symptoms</b>					
Trembling hands	1.4	0.6	1.7	2.6	3.8
Increased sweating	1.8	0.4	0.5	1.1	2.1
Palpitations	1.7	0.2	0.8	1.6	2.7
Shortness of breath	1.5	0.2	0.9	1.7	2.7
Sensitive to heat	1.7	0.1	0.9	1.7	2.6
Increased appetite	1.2	0.5	1.4	2.2	3.7
<b>Cognitive complaints</b>					
Problems remembering	3.2	0.4	0.6	1.3	2.2
Slow or unclear thinking	5.0	0.0	0.8	1.4	2.3
Difficulty finding words	2.8	0.1	0.8	1.5	2.5
Been confused	2.7	0.2	1.1	1.8	2.8
Difficulty learning	3.7	0.2	0.9	1.6	2.4
Difficulty concentrating	3.8	0.3	0.7	1.3	2.0
<b>Anxiety</b>					
Nervous	3.6	0.0	0.9	1.4	2.1
Afraid or anxious	3.4	0.3	1.1	1.6	2.3
Felt tension	3.5	0.3	0.7	1.3	2.1
<b>Depressivity</b>					
Sad	5.8	0.3	0.7	1.2	1.9
Depressed	4.6	0.2	0.9	1.4	2.0
Discouraged	5.2	0.0	0.8	1.4	2.1
Crying easily	2.1	0.0	0.8	1.5	2.2

Unhappy	4.0	0.2	0.7	1.3	1.9
Happy	1.8	2.1	-0.2	0.9	2.4
Self-confident	1.6	2.1	-0.4	0.8	2.0

Emotional susceptibility					
Difficulty coping	2.3	0.5	0.5	1.3	2.5
Not like yourself	2.5	0.1	0.7	1.3	2.2
Easily stressed	2.6	0.6	0.4	1.0	1.8
Mood swings	3.7	0.5	0.4	1.0	1.7
Irritable	3.6	0.6	0.4	1.1	1.9
Frustrated	4.3	0.2	0.6	1.2	1.9
Angry	2.4	0.1	0.9	1.5	2.3
Felt in control	1.7	2.0	0.3	0.8	2.0
Felt in balance	2.1	1.9	-0.6	0.6	1.6

Impaired daily life					
Difficulty managing daily life	4.9	0.2	1.0	1.5	2.2
Limit leisure activities	5.8	0.3	0.9	1.2	1.7
Difficulty participating in life	6.5	0.5	1.0	1.4	2.0
Difficulty getting around	2.7	0.7	1.3	1.7	2.3
Everything takes longer	2.8	0.1	0.8	1.2	1.9
Difficulty managing job	3.3	0.5	1.1	1.4	1.9

Impaired social life					
Difficult being with other people	3.7	0.6	1.2	1.8	2.6
A burden to other people	4.1	0.7	1.3	1.9	2.7
Conflicts with other people	2.3	0.9	1.8	2.6	3.0

Concerned being seriously ill					
Uneasy	4.3	0.2	1.3	1.3	2.2
Restless	2.3	0.1	1.5	1.5	1.3

Appearance					
Disease affect appearance	2.9	0.3	0.5	1.1	1.9
Unsatisfied with appearance	7.1	0.2	0.7	1.1	1.7
Mask visible signs	2.2	1.2	1.6	2.0	2.7
Bothered by people looking	2.6	1.3	1.8	2.2	2.5
Influence on clothes worn	2.3	1.0	1.4	1.8	2.6

Loose stools					
Upset stomach	1.4	0.0	1.0	1.9	3.0

Tiredness					
Been tired	3.3	1.2	0.2	0.4	1.2
Been exhausted	4.1	0.5	0.1	0.6	1.4
Difficulty getting motivated	3.9	0.5	0.3	0.7	1.5
Felt worn out	4.5	0.5	0.2	0.6	1.3
Full of life	2.6	2.3	-0.9	0.1	1.0
Energetic	2.7	2.4	-0.9	0.1	1.1
Able to cope with life	2.7	2.4	-1.1	-0.1	0.9

Eye symptoms					
Watery eyes	1.2	0.2	1.3	2.1	3.1
Bags under the eyes	1.9	0.2	0.7	1.4	2.2
Grittiness in eyes	1.9	0.5	1.3	2.1	3.0
Reduced sight	2.0	1.2	1.9	2.3	2.9
Pressure in eyes	2.2	0.9	1.6	2.2	2.7
Double vision	1.8	0.3	1.2	1.7	2.4
Pain in eyes	1.2	0.2	1.3	2.1	3.1
Sensitive to light	1.9	0.2	0.7	1.4	2.2

## RESULTS:

Most patients with hypothyroidism reported altered bowel function (41%). In particular, 33% complained of constipation, 4% diarrhoea and 4% alternate bowel pattern. The prevalence of altered bowel habits was lower in hyperthyroidism (33%, 22% constipation and 9% diarrhoea). A similar prevalence was found in those having goiter (30% had constipation, 3% diarrhoea and 4% had alternate bowel) and in thyroiditis (33, 7, 4%, respectively). Also, sleep disturbances were equally distributed among groups, being slightly more prevalent in subjects with hypothyroidism. Finally, mood/behaviour disturbances were equally present in all groups (from 47% in hyperthyroid to 65% in hypothyroid patients). Also, the type of alteration (i.e., anxiety, depression and panic attacks) were similarly represented, the largest prevalence being present for anxiety (over 50% of the cases), the

lowest for panic attacks (10% of cases). Fatigue was reported between 7% (hyperthyroidism) and 26% (goiter) of the cases mood/behaviour disturbances, independent of the type of thyroid disease.

Problems associated with poor QOL in relation to clinical status are reported. Mood/behavior disturbances and fatigue were significantly associated with alterations in most domains in clinically overt hypothyroidism, whereas muscle cramps and pruritus were the symptoms more commonly associated with poor QOL in overt hyperthyroidism. Fatigue was more commonly associated with a poor score in domains measuring physical health, whereas behaviour problems were related to altered domains measuring mental health.

## DISCUSSION:

The purpose of the present study is to look for QOL of individuals in abbreviated version of the ThyPRO. In this prospective cohort study, we have assessed QOL in patients with thyroid disorders. QOL has been measured longitudinally in hypothyroid patients with validated disease specific (ThyPRO). Impairments ranged from large differences for Tiredness to small differences for Physical Functioning, while Bodily Pain was the only unaffected scale. The wide array of impacts was corroborated in a recent population-based case-control study with tiredness being the most frequently reported symptom<sup>17</sup>. Our study quantifies that tiredness is severely impacted in newly diagnosed thyroid patients, as compared with the general population rather than reporting tiredness as a present/absent symptom, as is the classical diagnostic medical approach, quantifying it on a continuum, offers a more detailed picture of the course of disease symptomatology.

The cognitive complaints, even in patients with subclinical hypothyroidism are most likely an independent entity requiring separate evaluation<sup>18</sup>. Another aspect of particular interest is the poorly understood relationship between hypothyroidism and depression<sup>19</sup>. In a recent study both depressive symptoms and sexual dysfunction were related to subclinical hypothyroidism in female patients with hypothyroidism<sup>20</sup>. We found depressivity moderately impacted in the untreated state. The severity of sexual dysfunction cannot be compared with the general population in our study, as items in the ThyPRO scale for sexual impairments are asked with attribution to thyroid disease, and therefore irrelevant to the general population.

Strengths of our study are its longitudinal design, the use of validated disease-specific and generic questionnaires, and inclusion of general population reference groups. This conceptual framework can readily be applied to the study of quality of life in other diseases. However, there are also limitations. Although individuals had similar sociodemographic characteristics they tended to have more impaired QOL as compared with patients who had a full survey<sup>20</sup>.

Despite the limitations mentioned, benefits of addressing the patient perspective in medical communication are well established<sup>21</sup> and future studies should investigate whether QOL assessment in clinical practice can improve the care for hypothyroid patients<sup>22</sup>. Recent investigations encourage initiatives that stimulate ethical placebo mechanisms in clinical practice. QOL assessment could do so by contributing, in a positive manner, to the overall therapeutic context<sup>23</sup>. To advance its applicability, both in clinical practice and research, we have recently developed a short version of ThyPRO<sup>24</sup>. It constitutes the primary outcome in our on-going randomized controlled trial<sup>25</sup>, and can be put to ideal use in future trials. Our study shows that thyroid disease affects the perceived health status, independently of thyroid function. As hypothesized, hyperthyroid and hypothyroid patients reported poor QOL.

## CONCLUSION:

In conclusion, patients with thyroid diseases, independent of the severity of thyroid dysfunction, perceived diminished health status. In their clinical evaluation, physicians need to consider this aspect for a more comprehensive care of patients.

## AUTHOR DISCLOSURE STATEMENT

None of the authors has any financial conflicts of interest to declare.

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