Psychometric validation of new measures of hypothyroid-dependent quality of life (QoL) and symptoms

Royal Holloway University of London
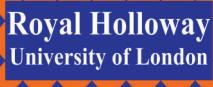
C V McMillan[1], C Bradley[1], S Razvi[2], J U Weaver[3]

[1]Health Psychology Research, Dept of Psychology, Royal Holloway, University of London, Egham, Surrey, UK.
[2]Department of Diabetes and Endocrinology, Queen Elizabeth Hospital, Gateshead, UK.
[3]University of Newcastle-upon-Tyne, School of Clinical Medical Sciences, Queen Elizabeth Hospital, Gateshead.

Gateshead Health NHS Trust

Introduction and Aims

- Hypothyroidism is a chronic disease with both physiological and psychological symptoms that are likely to have a considerable impact on the QoL of the patient.

- Thyroxine replacement therapy returns patients to a biochemically euthyroid state, but some treated patients continue to report persistent symptoms despite tests indicating their levels of thyroid hormones are within accepted reference levels.[1]

- The aim of this study was to evaluate the psychometric properties of two recently designed condition-specific questionnaires of QoL and perceived symptom severity in hypothyroidism: the ThyDQoL and the ThySC.[2]

Methods

A cross-sectional study in which 110 adults with hypothyroidism (89 women, 21 men), mean age 55.1 ± 14.3 years; 103 treated with thyroxine; attending primary care and hospital clinics; completed the questionnaires. All non-treated patients had subclinical hypothyroidism.

Reliability and principal components analyses were undertaken.

ThyDQoL – description

- An individualised, patient-centred questionnaire measuring perceived impact of hypothyroidism on QoL. It is based on the ADDQoL[3] for diabetes.

- 18 domains of life (e.g. family life, physical appearance) and 2 overview items (QI:*present QoL*, and QII:*thyroid-dependent QoL*).

- Respondents rate personally applicable life domains for impact of hypothyroidism and importance to their QoL. (Fig. 1).

- Larger domain scores (negative and positive, range –9 to +3) indicate more impact and more importance for QoL.

- An Average Weighted Impact score (AWI) is obtained by multiplying impact ratings by importance ratings and summing all applicable domains, before dividing by the number of domains applicable to the individual (range –9 to +3).

ThySC – description

- A checklist of 15 common hypothyroid symptoms for completion by patients. It is influenced by design of the Diabetes Symptom Checklist[4] and Asthma Symptoms Questionnaire.[5]

- Patients indicate whether each symptom is applicable and, if applicable, provide a 'bother' rating to indicate how much the symptom bothers them from 'not at all' (scoring 0) to 'very much bothered' (scoring 3) (Fig. 2).

- Symptoms marked not applicable are given a bother rating of 0 ('not at all bothered').

Fig. 1: A ThyDQoL item (showing scores assigned)

Fig. 2: A ThySC item (showing scores assigned)

Fig. 3: ThyDQoL: perceived impact of hypothyroidism

Fig. 4: ThySC: symptom bother ratings

Results

ThyDQoL

- Very high internal consistency reliability: [Cronbach's alpha = 0.95, N = 97].

- Forced 1-factor analysis showed that all 18 items loaded satisfactorily (>0.4), supporting the validity of calculating the overall AWI-18 score.

- All domains were perceived as negatively impacted by hypothyroidism (Fig. 3).

- When analysing relationships with ThySC variables in a given sample, the four symptom domains in the ThyDQoL, (*energy*, *weight*, *discomfort* and *depression*), should be excluded from calculation of AWI. Calculation of 14-item AWI-14 was supported by factor and reliability analyses [Cronbach's alpha = 0.94, N = 99].

ThySC

- Internal consistency reliability was unexpectedly high: [Cronbach's alpha = 0.81, N = 95].

- Exploratory factor analyses did not indicate a meaningful factor structure (none was expected). As 3 symptoms loaded <0.4 on a forced 1-factor analysis, there was insufficient support for calculation of a 'total symptom bother' score for the questionnaire.

- Highest frequencies of reported symptoms were:

	%	(N)
Tiredness	90%	(99)
Depression	73%	(80)
Skin problems	60%	(66)
Weight	59%	(65)

- Highest bother ratings were for *hair problems*, *weight*, *depression* and *feeling cold* (Fig. 4).

ThySC/ ThyDQoL relationships

- Highest significant correlations between ThyDQoL QI:*present QoL* and ThySC symptom bother ratings were rho = -0.44 (*tiredness*), and -0.4 (*depression*) (p<0.001); but the majority of these correlations (9/15 symptoms) were weak and not significant.

- Symptom bother ratings for *tiredness*, *concentration* and *weight* were the strongest predictors of AWI-14 [F(3,98) = 24.53, p<0.001] with *tiredness* contributing 35% of the variance.
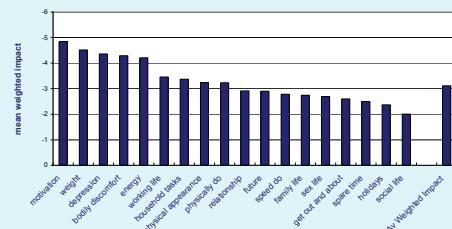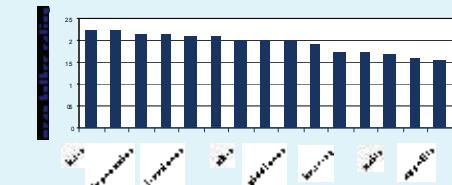
Conclusions

- The ThyDQoL and ThySC are new self-completion measures of perceived impact of hypothyroidism on QoL and of perceived symptom severity respectively.
- They are highly acceptable to patients.
- Their face and content validity, and internal consistency reliability are established.
- The ThyDQoL has provided evidence for the perceived negative impact of hypothyroidism on QoL.
- The ThySC has indicated relatively high perceived symptom bother for the majority of symptoms.

- Although measures of hypothyroid symptoms are often and erroneously described as QoL measures, the small correlations between the ThyDQoL and ThySC have shown that symptoms and QoL are distinct and separate patient-reported outcomes.
- The measures will assist health professionals in considering psychological as well as medical outcomes when treating people with hypothyroidism, and are suitable for clinical trials and routine clinical monitoring.

References

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Access to questionnaires

Clare Bradley PhD, Professor of Health Psychology
Royal Holloway, University of London
Egham, Surrey, TW20 0EX, UK.
E-mail: c.bradley@rhul.ac.uk

Enquiries

Carolyn McMillan PhD, Research Health Psychologist
Royal Holloway, University of London
Egham, Surrey, TW20 0EX, UK.
E-mail: c.mcmillan@rhul.ac.uk