**Development of the Coeliac Disease Assessment Questionnaire (CDAQ)**

Helen Crocker, Michele Peters, Crispin Jenkinson

Nuffield Department of Population Health, University of Oxford, UK

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**Introduction**

Evaluating health-related quality of life (HRQOL) in people with coeliac disease can provide a greater understanding of the condition than can be achieved by assessing clinical factors alone. HRQOL is assessed using patient reported outcome (PRO) measures, short questionnaires that measure health from the patient’s perspective. There are two existing disease-specific PROs that measure HRQOL in adults with coeliac disease, the Celiac Disease Questionnaire (CDQ) (Häuser et al., 2007) and the Coeliac Disease Quality of Life Survey (CD-QOL) (Dorn et al., 2010). However, there are limitations with both measures, in particular, with regards to the derivation and subsequent reduction of items.

The aim of this study was to develop a new PRO measure to assess HRQOL in adults with coeliac disease that meets current development guidelines, for example, those provided by the U.S. Food and Drug Administration (US FDA, 2009).

**Methods**

Items for the new measure, the Coeliac Disease Assessment Questionnaire (CDAQ), were developed following qualitative interviews with adults with coeliac disease, and refined through expert panels, cognitive interviews, and a translatability assessment. A draft version of the CDAQ was completed by 412 people with coeliac disease. Analysis of this data enabled the number of items to be reduced and dimensions to be generated.

The key steps involved in the development of the CDAQ are shown in Figure 1 below.

- **Qualitative interviews**
  Conducted 23 qualitative interviews with people with coeliac disease.

- **Development of candidate items**
  Developed 63 candidate items following a thematic analysis of qualitative interview data.

- **Expert opinions**
  Obtained feedback from experts, including health professionals and researchers, to refine the questionnaire items.

- **Cognitive interviews**
  Conducted cognitive interviews with people with coeliac disease. The interviews examined cognitive thought processes during questionnaire completion in order to identify sources of response error. Items were revised.

- **Translatability assessment**
  Undertook a translatability assessment to assess the cultural and linguistic translatability of the questionnaire. Items revised.

- **Survey**
  Members of Coeliac UK (n=412, response rate 52%) completed a draft S1-item version of the CDAQ.

- **Item reduction and scale generation**
  Nineteen items were removed following data analysis. A principal components analysis (with Varimax rotation) was conducted on the remaining items, identifying six meaningful dimensions, two of which were merged.

**Results**

The final version of the CDAQ contains 32 items addressing five dimensions: stigma (8 items); dietary burden (8 items); symptoms (5 items); social isolation (5 items); and worries and concerns (6 items). The questionnaire measures HRQOL over the past four weeks. Cronbach’s alpha values ranged between 0.82 and 0.88 for all dimensions, indicating good internal consistency.

The dimensions, Cronbach’s alpha values and example items are shown in Figure 2.

**Conclusions**

A new patient-reported outcome measure, the Coeliac Disease Assessment Questionnaire (CDAQ), has been developed according to current guidelines. The measure can be used in a range of settings, including clinical trials and clinical practice. For example, the questionnaire can be used in clinical trials to evaluate the effect of treatments on health-related quality of life. This will provide a broader understanding of the treatment than can be achieved by assessing clinical impact alone. Further assessment of the CDAQ’s reliability and validity is currently underway.

**Acknowledgements**

We would like to thank interview participants for sharing their experiences of living with coeliac disease and everyone who has provided feedback on draft versions of the measure. We would also like to acknowledge Coeliac UK for assisting with the recruitment of participants. This study is part of a doctoral research programme funded by the Medical Research Council (UK).

**References**

