

What Does the EQ-5D-Y-5L Measure in Comparison to other Generic Paediatric Health Related Quality of Life Instruments? A Dimensionality Assessment Using Factor Analysis

Mina Bahrapour¹, Renee Jones², Kim Dalziel², Nancy Devlin³, Brendan Mulhern¹, on behalf of QUOKKA (Quality of Life in Kids: Key Evidence for Decision Makers in Australia) team

1. Centre for Health Economics Research and Evaluation (CHERE), University of Technology Sydney
2. Health Economics Unit, University of Melbourne
3. School of Population and Global Health, University of Melbourne

Abstract

Objectives:

The EQ-5D-Y-5L (Y-5L) includes the same five dimensions of health-related quality of life (HRQoL) as the adult version. The Y-5L is one of a number of widely used generic measures of child HRQoL, including the Health Utilities Index (HUI), Child health Utility (CHU9D) and Paediatric Quality of Life Inventory (PedsQL). The content of each is different; yet there is little evidence on the measurement relationship between these instruments, and the additional domains of HRQoL added by each. This study aims to explore the measurement relationship between the Y-5L and other validated child HRQoL instruments, utilising unique data from the Australian Paediatric Multi-Instrument Comparison Study (P-MIC).

Methods: Data from the P-MIC study², were used. Y-5L, PedsQL, CHU9D and HUI 2/3 data were collected from both proxies and self-reported by children. Exploratory Factor Analysis (EFA) was used to investigate the underlying dimension structure. To assess overall dimensionality, the items from the four instruments were pooled, and modelled for child and proxy report separately. To build up a picture of the instrument relationships, the dimensionality between the Y-5L and each other instrument was examined. The suitability of data for EFA was checked using Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity. The number of factors was based on eigenvalues greater than one; eigenvalue measures the variance explained by each factor. The correlation coefficient for the variable and factor is shown by loadings in the analysis; this study used loadings more than 0.32, with cross-loading also considered. The factors were assumed to be correlated; hence oblique rotation (Promax) was used.

Results:

When applying EFA to the pooled model, additional domains not measured by the Y-5L can be identified. Results suggested a six-factor structure for the proxy data and a different but overlapping six-factor structure for the child self-report data. Factors related to mental health, pain and daily activities were covered by the Y-5L; however, additional factors related to social functioning, school functioning and senses (vision and hearing) were not. Assessing instrument pairs suggests that PedsQL is sensitive to social functioning and school functioning issues not explicitly measured by Y-5L. The sensitivity of HUI to hearing and vision reflects the inclusion of these as separate items in it.

Conclusion:

We provide evidence about what the Y-5L measures in comparison to other instruments. This study provides information which can be used to guide choice of generic instrument when measuring particular domains of HRQoL. The results also suggest factors that may represent relevant candidate items for Y-5L bolt-ons. These both align with and differ from bolt-ons identified for the adult EQ-5D. The results support earlier research suggesting that factor analysis

can be a useful statistical method for identifying potential gaps and new dimensions for EuroQol instruments.