Psychometric Properties of a Quality of Life Survey Instrument in a Sample of Medicare ESRD Beneficiaries

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BACKGROUND

The 36-item Kidney Disease Quality of Life assessment instrument (KDQOL-36) is an abbreviated version of a longer instrument developed by RAND in the 1990s. It includes three kidney disease-specific composite scales (Burden of Kidney Disease, Symptoms and Problems, and Effects of Kidney Disease), as well as physical and mental component subscales based on the 12-item Short Form Health Survey. IMPAQ administered the KDQOL-36 in 2016 and 2017 to Medicare beneficiaries aligned to one of 37 ESRD Seamless Care Organizations (ESCOs) participating in CMS's Comprehensive ESRD Care (CEC) Model, the nation's first condition-specific accountable care organization. The KDQOL-36 is widely used by dialysis facilities to meet CMS' requirements to assess the physical and mental health of patients annually. The measure developers and a recent analysis of data collected in dialysis settings showed that the kidney disease-specific scales were reliable and valid. However, the psychometric properties have not been evaluated in a population based sample.

OBJECTIVES

- Describe the psychometric properties of the KDQOL-36 in a household sample of Medicare ESRD beneficiaries aligned to a the CEC Model.
- Explain how the study findings support the reliability and validity of KDQOL-36 data collected through a household survey

POPULATION

IMPAQ administered the KDQOL-36 through a household survey to all Medicare ESRD beneficiaries aligned to 13 ESCOs in 2016 and a sample of beneficiaries aligned to 37 ESCOs in 2017. The analytic dataset included beneficiaries who completed enough survey items to calculate at least one of the three kidney disease-specific scales (n=6,800 in 2016 and n=6,918 in 2017, including n=1,119 who responded in both years).

METHODS

We conducted the following psychometric analyses for the 24 kidney disease-specific survey items. We conducted all analyses separately for 2016 and 2017 to assess the consistency of the psychometric properties across time.

Calculated Cronbach's alpha statistics

- Purpose: Measure the internal consistency reliability of the three scales
- Criteria for good internal consistency: Alpha > 0.80

Conducted a confirmatory factor analysis (CFA)

- Purpose: Determine whether the factor structure was consistent with the three-factor model reported in the literature.
- Model specifics: Three correlated factors model with a maximum likelihood estimator
- Criteria for good model fit: Root mean square error of approximation (RMSEA) < 0.06, Comparative Fit Index (CFI) > 0.90, Standardized Root Mean Square Residual (SRMR) < 0.08, and factor loadings > 0.4

Sensitivity Analysis

- Repeated the 2017 CFA including only first time respondents and compared the factor loadings

FINDINGS

Consistent with published data, the kidney disease-specific scales demonstrated good internal consistency reliability (Cronbach's alpha = 0.84 to 0.86).

The CFA model fit was acceptable, with RMSEA = 0.07, CFI = 0.89, and SRMR = 0.04 for both the 2016 and 2017 models. All factor loadings were > 0.4 in the 2016 model, and 23 out of 24 factor loadings were > 0.4 in the 2017 model.

Factor covariances were high, as expected:

- Burden and Symptoms: 0.58 - 0.59
- Burden and Effects: 0.75 for both years
- Symptoms and Effects: 0.77 - 0.78

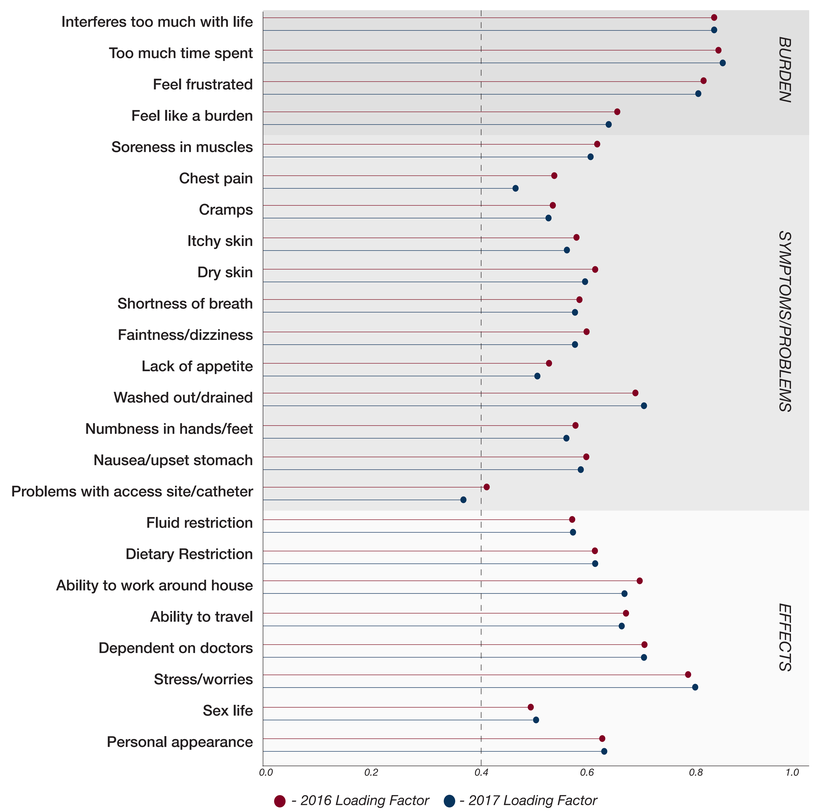
The 2017 CFA factor loadings were very similar (all within 0.01) when we included only the first time respondents, compared to the model including all respondents.

INTERNAL CONSISTENCY

Scale	Cronbach's Alpha	
	2016	2017
Burden of Kidney Disease	0.86	0.85
Symptoms/Problems	0.85	0.84
Effects of Kidney Disease	0.84	0.84

Key takeaway: The scales demonstrated good internal consistency (Cronbach's Alpha > 0.8)

FACTOR LOADINGS FROM CONFIRMATORY FACTOR ANALYSIS



Key takeaway: factor loadings were similar between years and supported the 3-factor model structure

CONCLUSIONS

The collection of quality of life data through a household survey promotes patient confidentiality and standardizes data collection procedures across a wide variety of patient care settings. **Our results were consistent across time and with similar studies using data collected in dialysis facilities, supporting the reliability and validity of KDQOL-36 data collected through a household survey.** Our results will help CMS to better understand quality of life in ESRD beneficiaries and develop patient-centered approaches to promote it.

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