Development and psychometric evaluation of the Telenursing Interaction and Satisfaction Scale (TISS)

Marie Mattisson
Department of Health, Medicine and Caring Sciences (HMV), Linköping University, Linköping, Sweden
Sussanne Börjeson
Department of Health, Medicine and Caring Sciences (HMV), Linköping University, Linköping, Sweden
Malou Lindberg
1177 Medical Advisory Service and Department of Health, Medicine and Caring services (HMV), Linköping University, Linköping, Sweden
Kristofer Årestedt
Faculty of Health and Life Sciences, Linnaeus University, Kalmar, Sweden; The Research Section, Region Kalmar County, Kalmar, Sweden

Background
The interaction between caller and telenurse in telenursing is crucial for outcomes such as adherence, safety, and caller satisfaction. Despite recurring demands of improved interaction in telenursing, few studies on the topic are available, partly due to lack of appropriate outcome measurements.

Aim of the study
The purpose of this study was to develop and evaluate psychometric properties of a new scale, the Telenursing Interaction and Satisfaction Scale (TISS), to measure caller satisfaction with interaction in telenursing.

Methods
Callers to the National Medical Advisory Service in Sweden (n=616) completed the TISQ, an existing 60-item questionnaire. Twenty-five items were selected to represent satisfaction with interaction in four theoretically anchored subscales: health information, professional-technical competence, affective support, and decisional control. Data quality was evaluated. Factor structure was evaluated with confirmatory factor analysis, convergent validity with Spearman correlations, internal consistency with ordinal alpha, scale reliability with composite reliability coefficients, and test-retest reliability with intraclass correlations.

Results
Amount of missing data was acceptable and equally distributed. Data deviated significantly from a normal distribution, but all response options were endorsed. The CFA confirmed the hypothesized four-factor structure. Factor loadings ranged from 0.56 to 0.97. Factor correlations were high (0.88-0.96). Internal consistency (ordinal alpha = 0.82-0.97), scale reliability (0.88-0.99) and test-retest reliability (ICC = 0.77-0.86) were satisfactory for all scales.

Conclusions and implications

The TISS holds satisfactory psychometric properties in the study sample and can be used as a measure of caller satisfaction with interaction in telenursing. Findings support the use of four sub-scales. A total-score can be calculated and used in situations where multi-collinearity is a problem.