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Psychometric Evaluation of the ASCOT-SCT4, a Preference-Based Quality of Life Instrument for Long-Term Care Service Users in Hong Kong: An Application of Item Response Theory

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Background

•By 2034, it is estimated that nearly 30% of Hong Kong (HK) population will be 65 years or above, with around 75% of them suffering from chronic condition to some degree. Consequently, the demand for formal long-term care (LTC) will increase significantly, making urgent development of a standardized instrument to evaluate the "value of money" of LTC services.

•The Self-completion 4-Level Adult Social Care Outcomes Toolkit (ASCOT-SCT4) is the first preference-based instrument of QOL in the context of LTC, rendering it a potentially valuable tool for supporting (economic) evaluations in this filed.

•Our team has translated and cultural adapted it into HK Chinese version. This study aims to evaluate the psychometric properties using item response theory (IRT).

Method

❑IRT model: Rasch partial credit model.

❑Assumptions: (1) Unidimensionality was checked by confirmatory factor analysis; (2) Local dependence: residual correlation of item pairs < 0.3.

❑Item ordering: the Item Category Characteristic Curves (ICCCs) were visually inspected to assess whether the thresholds between adjacent categories were ordered correctly.

❑Item fit: Infit and Outfit mean square statistics between 0.5 and 1.5 were deemed acceptable.

❑ Targeting: A person-item map visualized the alignment between the distribution of participant abilities and item threshold locations on the same latent trait continuum in logit units.

Conclusion

•The HK Chinese version of the ASCOT-SCT4 is valid based on the IRT analysis.

•Attention should be given to the measurement gap for individuals with higher LTC-related QoL. Further study exploring whether adding items or response options could improve measurement coverage would be beneficial

Results

•A total sample of 312 LTC service users aged 60 or above were included in the data analyses. The distribution of item responses were presented in Figure 1.

•Unidimensionality and local independence were supported. As shown in Table 1, all items demonstrated acceptable fit (Infit/Outfit = 0.5–1.5).

•The ICCCs (Figure 2) illustrate that, thresholds for all items were logically ordered, with each presents a distinct and non-overlapping probability peak on the trait scale.

•The person-item map (Figure 3)shows that, all items generally covered a broad portion of the person ability distribution; however, a measurement gap was evident at the lower end (below -1.444 logits).

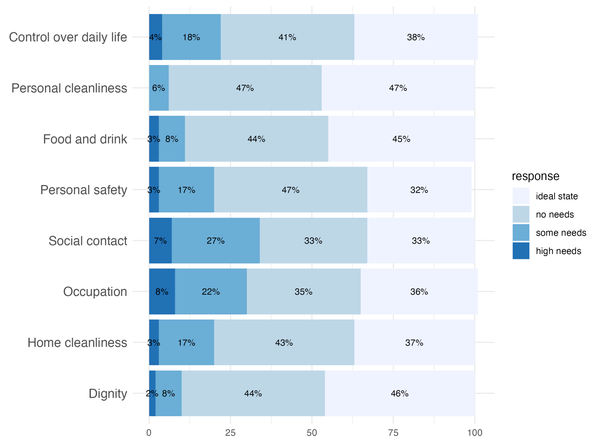

Figure 1. Distributions of HK Chinese ASCOT–SCT4 responses

Table 1. Estimated thresholds and item fit from IRT (Rasch partial credit) model (N=312)

Domains	Mean threshold	Threshold 1 (SE)	Threshold 2 (SE)	Threshold 3 (SE)	Outfit MSQ	Infit MSQ
Control over daily life	0.449	-1.118 (0.139)	0.511 (0.173)	1.954 (0.337)	0.849	0.832
Personal cleanliness	0.640	-0.823 (0.129)	2.104 (0.262)	/	0.905	0.917
Food and drink	0.826	-0.872 (0.130)	1.524 (0.224)	1.827 (0.426)	0.791	0.838
Personal safety	0.493	-1.444 (0.141)	0.674 (0.171)	2.248 (0.376)	0.858	0.845
Social contact	0.036	-1.135 (0.151)	-0.309 (0.159)	1.551 (0.256)	0.715	0.739
Occupation	0.071	-1.070 (0.146)	-0.022 (0.166)	1.304 (0.255)	0.797	0.785
Home cleanliness	0.616	-1.168 (0.137)	0.638 (0.174)	2.379 (0.395)	1.045	1.039
Dignity	0.946	-0.863 (0.130)	1.555 (0.225)	2.147 (0.472)	1.336	1.247

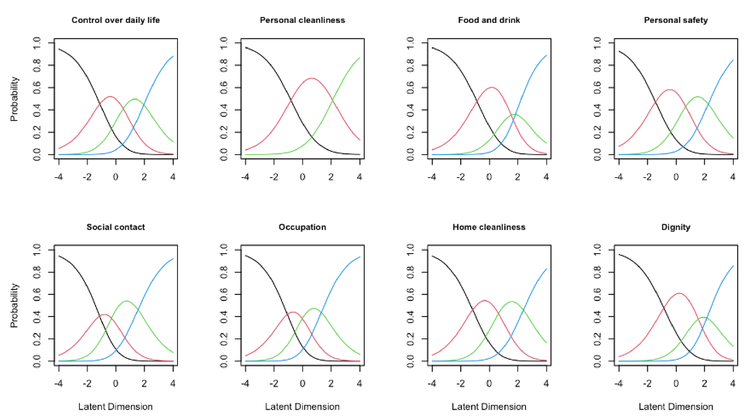

Figure 2. Item characteristic curves (ICCCs) for each item of the Chinese ASCOT-SCT4

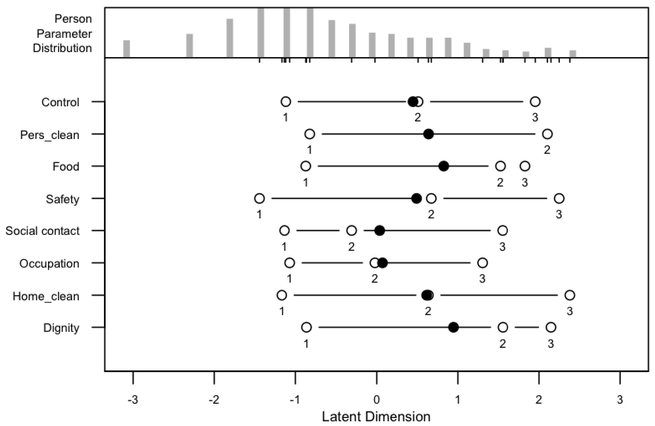

Figure 3. Person item map of the HK Chinese ASCOT-SCT4

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