Evaluating the Psychometric Properties of the Brazilian Portuguese EQ Health and Well-Being Short Form (EQ-HWB-S)

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Introduction

The EQ Health and Well-Being (EQ-HWB) instruments are designed to assess health and well-being outcomes across various populations. This study evaluates the psychometric properties of the Brazilian Portuguese version of the EQ-HWB Short Form (EQ-HWB-S) in a population of economically disadvantaged families.

Methods

We employed a mixed-methods approach with face-to-face interviews (n=99) using an interviewer-administered version of the EQ-HWB-S. Study components included:

- Baseline data collection using multiple instruments
- Test-retest reliability assessment (n=45, 10-day interval)
- Cognitive debriefing interviews (n=57)

Comparative Measures
Validation included concurrent administration of:
- EQ-5D-3L and 5L
- Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS)

Analysis Methods
We conducted comprehensive psychometric testing including response distribution analysis, exploratory factor analysis, convergent validity assessment, and reliability testing using both classical and modern psychometric approaches.

Results

Score Distribution
- Mean EQ-HWB-S index: 0.707 (SD=0.27)
- Response patterns showed slight skewness with some floor/ceiling effects in mobility and activities dimensions, suggesting potential limitations in capturing extremes of these domains.

Convergent Validity
Correlation coefficients with established measures:
- EQ-5D Index: 0.33
- EQ-5D VAS: 0.38
- WEMWBS: 0.45

Factor Structure Analysis
- EQ-HWB showed measurement scope comparable to EQ-5D
- Stronger alignment with physical well-being domains compared to WEMWBS
- Better alignment with physical well-being domains
- Demonstrated good construct coverage

Table 1. Convergent Validity of the EQ-HWB-S with Standard Measures

Measure	Correlation	p-value
EQ-5D-5L Index	-0.580**	<0.001
EQ-5D-5L VAS	-0.320**	0.003
SWMWBS	-0.360**	<0.001

**Negative correlations reflect inverse scoring conventions.

Figure 1. Test-retest Agreement of EQ-HWB-S Scores (n=45, 10-day interval)
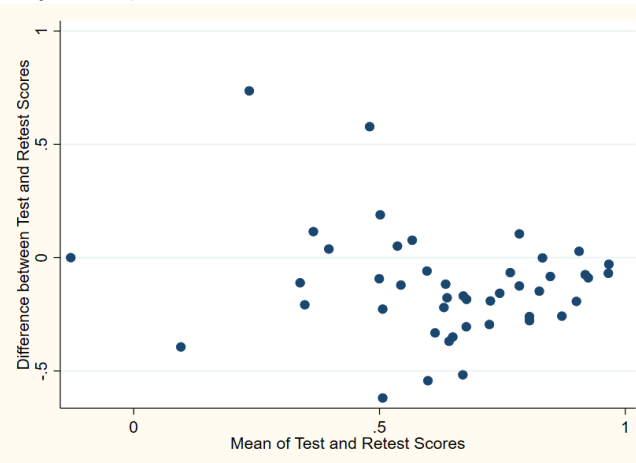
Test-retest Reliability Analysis

Temporal stability was assessed over a 10-day interval (n=45)

- Concordance correlation (ρc): 0.504 (SE=0.102); Pearson correlation (r): 0.568 (p<0.001)
- Most differences fall within ±0.5 units, indicating acceptable individual-level variation
- No systematic pattern across score range suggests consistent reliability regardless of well-being level
- Spread of points demonstrates expected variability for subjective measures

Discussion & Conclusions

Reliability Findings
The test-retest analysis revealed moderate temporal stability (ρc=0.504), which should be interpreted in context:
- Expected variability due to the subjective nature of well-being measures
- Comparable to other validated well-being instruments
- Acceptable for monitoring group-level changes over time

Psychometric Strengths
The EQ-HWB-S demonstrated several robust properties:
- Strong convergent validity with established measures
- Minimal floor/ceiling effects in most dimensions
- Clear factor structure aligned with theoretical constructs

Study Limitations
Known-groups validity analysis showed limited discriminatory ability compared to WEMWBS items, suggesting potential areas for refinement in specific population contexts.

Conclusions
The Brazilian Portuguese EQ-HWB-S demonstrates adequate psychometric properties for assessing well-being in disadvantaged populations, with particular strengths in construct validity and acceptable temporal stability.

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