

Evaluating Performance of the Experimental EQ-TIPS (V3) for Assessing Infants and Toddlers with Acute Infections: A Mixed-Methods Approach of Cognitive Debriefing and Psychometric Testing

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OBJECTIVE

- The EuroQol Toddler and Infant Populations (EQ-TIPS) was developed to assess health-related quality of life (HRQoL) in children aged 0–3 years.
- While the earlier 6-item, 3-level EQ-TIPS (V2) has been tested, the experimental 7-item version (V3) with 3- or 5-level response scales (EQ-TIPS-3L and EQ-TIPS-5L) has not yet been evaluated.
- This study assessed the updated experimental EQ-TIPS among caregivers of infants and toddlers with acute infections in Singapore.

METHOD

- We used a mixed-methods design, comprising cognitive interviews and psychometric testing.
- Primary caregivers of children participated in interviews exploring comprehensiveness, relevance, and interpretation of EQ-TIPS items and the visual analogue scale (VAS), which were then analysed thematically.
- For psychometric testing, caregivers of children with acute infections such as bronchiolitis or gastroenteritis were recruited from a tertiary hospital's emergency department.
- At baseline, caregivers completed EQ-TIPS-3L, EQ-TIPS-5L, PedsQL and global health to assess ceiling and floor effects, as well as convergent validity.
- Two weeks later, follow-up assessments were conducted via Zoom to evaluate responsiveness to clinical change in health using standardized response means (SRM) of EQ-TIPS-3L and EQ-TIPS-5L level sum scores (LSS).

RESULTS

- Caregivers (n=10) found EQ-TIPS acceptable, relevant, and easy to complete, although some ambiguity was noted in emotion and sleep items, with suggestions to extend the recall period and simplify the EQ VAS (Figure 1).
- For the data from 77 caregivers of children (40 reassessed), ceiling effects (1111111) were 28.6% (3L) and 16.9% (5L), while floor effects were 0%.
- Both versions demonstrated strong convergent validity ($\rho = 0.71$), as well as moderate negative correlations with EQ VAS ($\rho = -0.41$ for 3L; -0.42 for 5L) (Table 1).
- At follow-up, large SRMs among caregivers reporting HRQoL improvements indicated good responsiveness: -0.82 (EQ-TIPS-3L LSS), -0.81 (EQ-TIPS-5L LSS), and 1.47 (EQ VAS) (Table 2).

Figure 1. Themes and subthemes from cognitive debriefing interviews

1) Unanimous coherence, comprehensiveness, and suitability of questionnaire in Singapore		
Clarity and ease of use		Relevancy and comprehensiveness of items
2) Variability in interpreting EQ-TIPS items		
Perceived emotional management norms		
3) Possible future directions for EQ-TIPS		
Expansion of measured time frame	Refinement of VAS	Expanded HRQoL indicators

"Easy to understand and answer, and I like it that it's pretty short... That is pretty straightforward..." (S10)

"But for an infant it's a bit difficult to have such expectations. I think this... maybe 2 to 3 years old. But for infant... for them to throw tantrums like crying... it's normal." (S8)

"Today... is a very short period of time... He could have just recovered. So maybe... 3 to 5 days... will be a better window of review." (S9)

Table 1. Convergent validity of EQ-TIPS-3L, EQ-TIPS-5L, EQ VAS and PedsQL using Spearman's rho (ρ)

	EQ VAS	EQ-TIPS-3L LSS	EQ-TIPS-5L LSS	PedsQL
EQ VAS	1.000			
EQ-TIPS-3L LSS	-0.407	1.000		
EQ-TIPS-5L LSS	-0.422	0.712	1.000	
PedsQL	-0.097	0.373	0.290	1.000

Table 2. Responsiveness using standardized response means (SRMs) among Unchanged versus Improved global health categories

Instrument	Baseline Mean (SD)	Follow-Up Mean (SD)	SRM Estimate	Std. Error	95% CI	p-value
Improved group (n=30)						
EQ-TIPS-3L LSS	9.28 (2.27)	7.78 (1.37)	-0.82	0.15	(-1.12, -0.52)	<0.001
EQ-TIPS-5L LSS	10.78 (3.73)	8.35 (1.66)	-0.81	0.12	(-1.05, -0.57)	<0.001
EQ VAS	58.32 (22.69)	88.35 (10.36)	1.47	0.23	(1.01, 1.93)	<0.001

Note: Improved group refers to the group of participants who had improved global health scores between baseline and 2-week follow-up.

CONCLUSIONS

Both EQ-TIPS-3L and EQ-TIPS-5L demonstrated good content and construct validity, as well as responsiveness to recovery, for assessing acutely ill young children. Despite some item ambiguity, findings support their use in evaluating HRQoL in this population.

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