

Valuation of Child Health-Related Quality of Life by Child Age and Problem Duration

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OBJECTIVES

We conducted 16 EQ-5D-Y-3L valuation studies and tested whether the value that U.S. adults place on relieving a child's health problems depends on the child's age and the problem duration.

METHODS

- In Spring 2024, 2,577 U.S. adults were assigned to one of 16 arms that differed only in the child's age (4, 7, 10, or 13 years) and problem duration (1, 2, 6, or 12 months).
- Each participant completed a DCE with five paired comparisons (i.e., choosing between a child's HRQoL profile or being "in a coma") and 20 **kaizen tasks** (single d-efficient block).
- Using this stated preference evidence, we estimated a conditional logit model for each arm and tested for differences in main-effects using cluster bootstrap techniques.

RESULTS I

- This study produced 16 EQ-5D-Y-3L values sets using small samples (N=149 to 169; median 18 minutes).
- In each value set, all 10 incremental differences in levels were positive (p-value < 0.05) with the highest value on alleviating a child's pain/discomfort.
- The value of the worst profile (33333) is less than or equal to being "in a coma", ranging from 0.202 to -0.346.

What is a kaizen task?

Instead of choosing between two profiles directly, respondents make sequential choices to improve one profile (preference path).

Please select three improvements.
Which problem do you prefer to relieve **first?** **Second?** **Third?**
Your choices directly relieve the health problems of the child.

Warm-up task	A 10-year-old child has the following problems for 1 week	Potential improvements
Mobility (walking around)	A lot of problems walking around	No problems walking around
Taking care of myself	A lot of problems taking a bath or showering by myself or getting dressed by myself	No problems taking a bath or showering by myself or getting dressed by myself
Doing usual activities	A lot of problems doing my usual activities	No problems doing my usual activities
Having pain or discomfort	A lot of pain or discomfort	No pain or discomfort
Feeling worried, sad or unhappy	Not worried, sad or unhappy	
Which problem do you prefer to relieve first?	A 10-year-old child has the following problems for 1 week	Potential improvements

Respondent view	After 1 st improvement	After 2 nd improvement	After 3 rd improvement
33331 Origin Profile	33311		
One of 24 possible paths from the origin to the destination.	33131	33111	11311
	31331	31311	13111
	13331	13311	11111 Destination Profile

Researcher view	Each preference path implies three choices .					
	1 st Set		2 nd Set		3 rd Set	
Fourteen choice probabilities (%) from the warm-up task of the 2023 U.S. EQ-5D-Y-3L valuation study (N=631).	33311	67%	33111	22%	31111	21%
	33131	10%	31311	22%	13111	35%
	31331	11%	13311	39%	11311	35%
	13331	12%	31131	5%	11131	9%
	All profiles with 1 improvement		13131	6%	All profiles with 3 improvements	
			11331	6%		
			All profiles with 2 improvements			

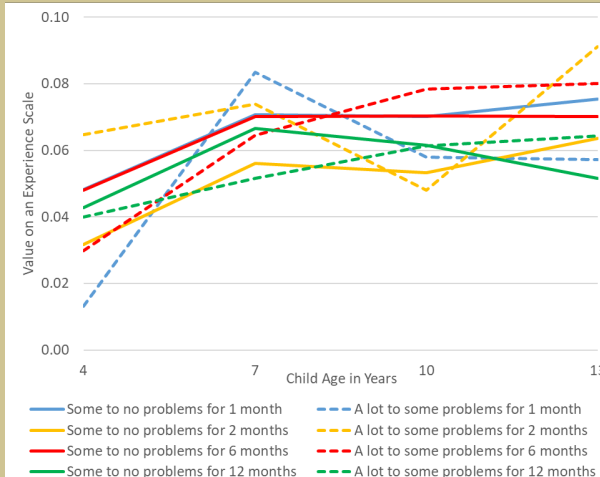
RESULTS II

- Child age affects the value that U.S. adults place on "taking care of myself" (right) but no other main effects.
- We found no differences in the main effects by problem duration.

Lesson: The relevance of problems in performing self-care depends on a child's age, possibly due to perceived differences in developmental norms.

- In kaizen tasks, respondents relieve health problems (left), instead of choosing between profiles directly, which is particularly advantageous in child health valuation.
- Each kaizen tasks collects seven times the preference evidences as a paired comparison (left), which is particularly advantageous for larger descriptive systems (e.g., bolt-on, deep-dive, HWB)
- The experimental design and choice modelling of a DCE with kaizen tasks (left) is the same as a DCE with paired comparisons.
- Including a few paired comparisons alongside kaizen tasks is sufficient to estimate values on a given scale.

Lesson: A small DCE with kaizen tasks may produce value sets on various scales and scenarios (e.g., child age).



CONCLUSIONS

- Upon closer examination, the Figure (above) illustrates that U.S. adults seem to place a lower value on 'looking after myself' at 4 years old compared to ages 7, 10, and 13.
- This finding on self-care is not unexpected, and to some extent, an indication of the internal validity of our methods.
- According to the U.S. CDC, having **difficulty with self-care** at age 4 is developmentally appropriate.
- These results highlight the need for age-appropriate items and attributes in child HRQoL measurement and valuation, as recommended for an adapted version of the EQ-5D-Y-3L designed for ages 2 to 4.

1. Jumamyradov M, Craig BM, Rivero-Arias O, Jakubczyk M. Child health valuation protocol for a discrete choice experiment comparing paired comparison and kaizen tasks and estimating US EQ-5D-Y-3L values on an experience scale. BMJ Open. 2023 Oct 24;13(10):e077256. doi: 10.1136/bmjopen-2023-077256. PMID: 37879694; PMCID: PMC10603523.

2. Craig BM, Rand K, Hartman JD. Preference Paths and Their Kaizen Tasks for Small Samples. Patient. 2022 Mar;15(2):187-196. doi: 10.1007/s40271-021-00541-z. Epub 2021 Jul 30. PMID: 34327605; PMCID: PMC8321769.