Comparing the performance of the Afaan-Oromo language versions of the EQ-5D-Y-3L and EQ5D-Y-5L among children and adolescents in Ethiopia

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Objective

- To compare the measurement properties of Afaan-Oromo language versions of the EQ-5D-Y-3L (Y-3L) and EQ-5D-Y-5L (Y-5L) among children and adolescents with and without disease conditions.

Methods

- Children and adolescents aged 8–15 years diagnosed with Asthma, Acute Lymphocytic Leukemia (ALL), and Congestive Heart Failure (CHF) from two government hospitals and from two schools (Afaan-Oromo taught) in Addis Ababa, Ethiopia were included.
- Participants self-completed the Y-3L, Y-5L, and the self-rated health question on two occasions: baseline and again up to 7 days later for those who responded no change in their global health rating scale.
- The order of the questionnaires was randomized, and three trained research assistants facilitated the data collection.
- Y-3L and Y-5L were compared in terms of feasibility, ceiling effect, redistribution, informativity, test-retest reliability, and known group validity.

Analysis

- Descriptive statistics (mean, SD, and percentages) were used to present the descriptive system and EQ-VAS data.
- Feasibility was assessed by comparing the percentage of missing values.
- Shannon diversity index (*H'*) and Shannon Evenness Index (*J'*)were used to evaluate the absolute and relative informativity of the instruments
- Cohen's Kappa agreement and ICC using a two-way mixed effect model with absolute agreement were used to assess the test-retest reliability.
- Non-parametric Kruskal–Wallis rank test with a pair wise comparison was used to assess the known group validity.

Results

- A total of 473 participants, Asthma (n=100), ALL (n=73), CHF (n=100), and school students (n=200), completed both instruments.
- Participants' mean age was 11.1 (2.2) years.
- Overall, the proportion of missing responses was 3.8% for Y-3L and 4.2% for Y-5L versions.
- The ceiling effect was 52% for the Y-3L and 46% for Y-5L (X^2= 231, p<0.001) [Table 1].
- Response distribution was checked for all Y-3L – Y-5L level combinations and the proportion of inconsistencies ranged from 4.4% for Worried, Sad or Unhappy (WSU) to 7.0% for Looking After Myself (LAM) and Pain or Discomfort (PD).
- Responses in the Y-3L were well distributed to the pairs of Y-5L as intended, with a low proportion of inconsistencies [Figure 1].
- The Y-5L demonstrated more discriminatory power with a higher Shannon diversity index (*H'*=1.12 vs. *H'*= 0.86) and Shannon Evenness Index (*J'*= 0.54 vs. *J'*= 0.48) compared to the Y-3L.
- Both the Y-3L (k=0.56) and Y-5L (k=0.65) showed moderate to substantial agreement across dimensions and the level sum score had good (ICC=0.73) and excellent (ICC=0.87) test-retest reliability, respectively [Table 2].
- Known-group validity was also confirmed, i.e., both instruments demonstrated differentiation between those with health conditions and general school children (p < 0.05) [Table 3].

Table 1. Ceiling effect for the EQ-5D-Y-3L and EQ-5D-Y-5L

Category		N	Ceiling Y-3L, %	Ceiling Y-5L, %	Absolute reduction, %	Reduction %
Conditions	ALL	73	11.0	12.3	-1.3	-11.4
	Asthma	100	37.0	28.0	9	24.3
	CHF	100	55.0	36.0	19	34.5
	School children	200	78.5	77.8	0.7	0.8
Age groups	8-11 years	259	44.8	39.4	5.4	12
	12-15 years	214	60.7	53.7	7	11.5
Dimensions	MOB	-	76.5	69.5	7	9.2
	LAM	-	80.7	76.7	4	5
	UA	-	75.5	73	2.5	3.3
	P/D	-	74.8	73.8	1	1.3
	WSU	-	81.8	72.5	9.3	11.4
Total		473	52	45.8	6.2	12
McNemar's test						0.002*

Note. Ceiling: 11111; *Y-3L: *: p<0.05*

Table 2. Test-retest reliability of the EQ-5D-Y-3L and EQ-5D-Y-5L

Dimensions	EQ-5D-Y-3L			EQ-5D-Y-5L		
	Chronic conditions n=244	School student n=200	Total n=444	Chronic conditions n=244	School student n=200	Total n=444
MOB[A]	0.48	0.67	0.57	0.57	0.66	0.63
LAM[A]	0.44	0.37	0.47	0.64	0.65	0.67
UA[A]	0.41	0.48	0.50	0.59	0.66	0.64
P/D[A]	0.47	0.65	0.55	0.59	0.76	0.65
WSU[A]	0.70	0.77	0.73	0.60	0.73	0.65
LSS[B]	0.78	0.51	0.73	0.90	0.60	0.83
EQ-VAS[B]				0.88	0.67	0.87

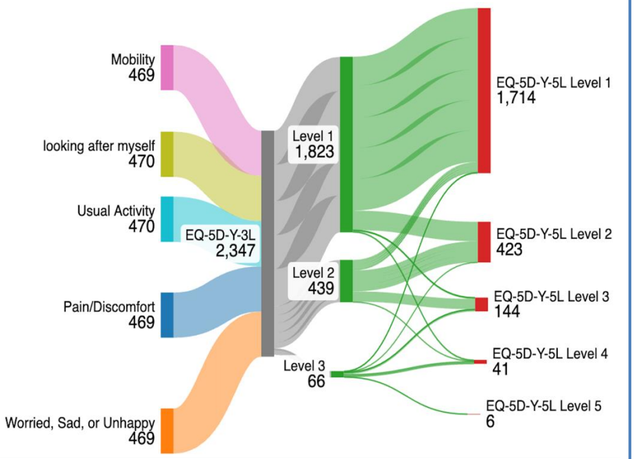
***Chronic health conditions** (ALL, CHF, and asthma); **A:** weighted Cohen's kappa single measures; **B:** ICC (intraclass correlation coefficient); All **ICCs** were 2-way random, absolute agreement. School students: health students*

Table 3. Known group validity among healthy disease conditions

Variables	Health conditions			School students	Kruskal-Wallis Rank Test			
	ALL (A)	Asthma (B)	CHF (C)	SS (D)		A vs. D	B vs. D	C vs. D
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean rank	p-value		
Y-3L, LSS	8.2 (2.2)	5.8 (1.2)	6.6 (1.9)	5.3 (1.0)	118.9	<0.0001	<0.0001	<0.0001
Y-5L, LSS	10.2 (3.7)	5.9 (0.9)	7.4 (2.9)	5.6 (1.8)	133.3	<0.0001	<0.0001	<0.0001
EQ-VAS	61.8 (20.9)	71.2 (10.5)	65.2 (12.2)	96.1 (3.3)	157.4	<0.0001	<0.0001	<0.0001

LSS: Level Sum Score; ALL: Acute Lymphocytic Leukemia, CHF: Congestive Heart Failure, Vs: Versus; SS: School students (healthy students)

Figure 1. Redistribution of EQ-5D-Y-3L response levels to EQ-5D-Y-5L response levels



Conclusion

- The Afaan-Oromo language versions of EQ-5D-Y-5L appear to have a lower ceiling effect, higher discriminatory power, and higher test-retest reliability agreement compared to the EQ-5D-Y-3L. The feasibility and known-group validity of EQ-5D-Y-5L was comparable with the EQ-5D-Y-3L..
- The Y-3L and Y-5L were able to detect the difference between the school students and each disease conditions.
- Both versions appear to be appropriate measures for measuring HRQoL of Afaan-Oromo-speaking children and/or adolescent population groups in Ethiopia.

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