Validity, reliability, and responsiveness of the EQ-5D in haematological cancers: a systematic review of measurement properties

A. Dudzisz[1], G.W. Basak[2], E. Snarski[3], D. Golicki[1]

[1]Department of Experimental and Clinical Pharmacology, Medical University of Warsaw, Warsaw, Poland; [2]Department of Hematology, Oncology and Internal Medicine, Medical University of Warsaw, Warsaw, Poland; [3]Chair and Department of Experimental and Clinical Physiology, Centre for Preclinical Research, Medical University of Warsaw, Warsaw

Contact information

Dominik Golicki dominik.golicki@wum.edu.pl

Validity, reliability, and responsiveness of the EQ-5D in haematological cancers: a systematic review of measurement properties

SA66

A. Dudzisz[1], G.W. Basak[2], E. Snarski[3], D. Golicki[1]

[1]Department of Experimental and Clinical Pharmacology, Medical University of Warsaw, Warsaw, Poland; [2]Department of Hematology, Oncology and Internal Medicine, Medical University of Warsaw, Warsaw, Poland; [3]Chair and Department of Experimental and Clinical Physiology, Centre for Preclinical Research, Medical University of Warsaw, Warsaw.

INTRODUCTION & OBJECTIVE

- The available data support the construct validity and responsiveness of the EQ-5D across multiple disease areas and conditions, however in haematological disorders, evidence on the EQ-5D's construct validity and responsiveness is either suboptimal or entirely lacking [1].

- This study aimed to conduct a systematic review of the published evidence regarding the measurement properties of the EQ-5D (EQ-5D-3L and EQ-5D-5L) in patients with haematological cancers.

METHOD

- A comprehensive literature search was carried out utilizing the MEDLINE and EMBASE (up to January 2025).

- Full-text English articles focusing on original research concerning the measurement properties of the EQ-5D, including construct validity, test-retest reliability, or responsiveness, were included.

- Studies were excluded if they did not assess the EQ-5D or used experimental versions, were non-empirical, not available in full text, or not published in English. Reviews, letters, books, editorials, notes, and conference materials were also excluded.

- The quality assessment utilized the COSMIN Risk of Bias checklist, and data synthesis followed the COSMIN methodology (Figure 1).

Figure 1. Diagram showing the methodologic quality and the COSMIN based final overall quality rating.
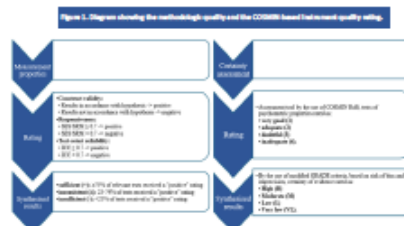
RESULTS

- A total of 15 studies from 30 countries, presenting 889 individual tests of the EQ-5D measurement properties were included (Figure 2, Table 1, references of included studies in handouts).

- The median sample size was 298 patients, and the mean patient age across studies was 56.5 years.

- Sufficient construct validity for EQ-5D-5L Index, EQ-5D-5L dimensions, EQ-5D-3L Index, EQ-5D-3L dimensions, and EQ VAS was supported by high certainty (Table 2, Table 4, and Table 5 in handouts).

- Evidence regarding test-retest reliability was limited to EQ-5D-5L Index and EQ VAS, had moderate certainty, and indicated sufficient overall rating of measurement properties (Table 3, Table 5 in handouts).

- Responsiveness data were available only for the EQ-5D-5L Index and EQ-5D-3L Index. Overall measurement properties were rated as sufficient, with high certainty of evidence.
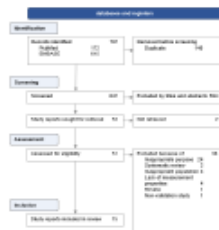

Figure 2. PRISMA-COSMIN for SRMs 2024 flow diagram.

Table 1. Included articles and its characteristics (n=15).

Table 2. Measurement property and variability of evidence for EQ-5D-5L Index and EQ-5D-5L dimensions – construct validity.

Table 3. Measurement property and variability of evidence for EQ-5D-5L Index and EQ-5D-5L dimensions – test-retest reliability.

CONCLUSIONS

- The available evidence suggests that both EQ-5D-3L and EQ-5D-5L have sufficient convergent validity and may be used to assess HRQoL in patient with haematological cancers.

- Evidence regarding test-retest reliability remains limited and requires further strengthening.

- Caution should be exercised when utilizing the EQ-5D to evaluate changes in HRQoL in longitudinal studies involving patients with haematological malignancies, as the current data on its responsiveness are limited.

REFERENCES

1. NICE. CHTE methods review. Health-related quality of life. Task and finish group report. July 2020. www.nice.org.uk/Media/Default/About/what-we-do/our-programmes/nice-guidance/chte-methods-consultation/Health-related-quality-of-life-task-and-finish-group-report.docx.

FUNDING

CONTACT INFORMATION

Dominik Golicki dominik.golicki@wum.edu.pl

Table 4. Measurement property and certainty of evidence for EQ-5D-3L Index and EQ-5D-3L dimensions – construct validity.

	EQ-5D-3L Index			EQ-5D-3L dimensions		
	Papers (tests), n	MP (positive tests), %	CoE (N)	Papers (tests), n	MP (positive tests), %	CoE (N)
Total	4 (43)	+ (86%)	H (1,511)	3 (210)	+ (100%)	H (1,461)
Disease						
HM[a]	1 (4)	+ (100%)	H (50)	-	-	-
AML	1 (8)	+ (100%)	H (168)	1 (20)	+ (100%)	H (168)
MM	1 (1)	+ (100%)	H (674)	1 (40)	+ (100%)	H (674)
MDS	1 (30)	+ (100%)	H (619)	1 (150)	+ (100%)	H (619)
Country						
Australia	1 (10)	+ (80%)	H (619)	1 (50)	+ (100%)	H (619)
Canada	1 (4)	+ (100%)	H (50)	-	-	-
China	1 (8)	+ (100%)	H (168)	1 (20)	+ (100%)	H (168)
Italy	1 (10)	+ (80%)	H (619)	1 (50)	+ (100%)	H (619)
UK	1 (10)	+ (80%)	H (619)	1 (50)	+ (100%)	H (619)
USA	1 (1)	+ (100%)	H	1 (40)	+ (100%)	H (674)
Language						
Chinese	1 (8)	+ (100%)	H (168)	1 (20)	+ (100%)	H (168)
English	3 (25)	+ (84%)	H (619)	1 (140)	+ (100%)	H (674)
Italian	1 (10)	+ (80%)	H (619)	1 (50)	+ (100%)	H (619)

AML acute myeloid leukaemia; *CoE* certainty of evidence; *H* high; *HM* haematological malignancies; *MDS* myelodysplastic syndromes; *MM* multiple myeloma; *MP* overall rating of measurement properties; *N* numer of respondents; *RoB* risk of bias;

[a] Leukaemias, lymphomas, multiple myeloma.

Table 5. Measurement property and certainty of evidence for EQ-5D VAS – construct validity and test-retest reliability.

	Construct validity			Test-retest reliability		
	Papers (tests), n	MP (positive tests), %	CoE (N)	Papers (tests), n	MP (positive tests), %	CoE (N)
Total	5 (50)	+ (94%)	H (1,176)	2 (2)	+ (100%)	M[a] (498)
Disease						
Leukaemias	3 (40)	+ (100%)	H (726)	1 (1)	+ (100%)	H (298)
AML	2 (33)	+ (100%)	H (428)	-	-	-
Lymphomas	2 (10)	± (70%)	H (450)	1 (1)	+ (100%)	L[b] (200)
MCL	1 (2)	+ (100%)	H (250)	-	-	-
Country						
China	2 (15)	+ (80%)	H (498)	2 (2)	+ (100%)	M[a] (498)
Netherlands	1 (15)	+ (100%)	H (111)	-	-	-
Multicountry studies	2 (20)	+ (100%)	H (567)	-	-	-
Language						
Chinese	2 (15)	+ (80%)	H (498)	2 (2)	+ (100%)	M[a] (498)
Dutch	1 (15)	+ (100%)	H (111)	-	-	-
English	2 (20)	+ (100%)	H (567)	-	-	-

AML acute myeloid leukaemia; *CoE* certainty of evidence; *H* high; *L* low; *M* moderate; *MCL* mantle cell lymphoma; *MP* overall rating of measurement properties; *N* numer of respondents; *RoB* risk of bias; *VAS* visual analogue scale;

[a] Quality downgraded by 1 level due to RoB (50% of studies with at least adequate methodological quality);

[b] Quality downgraded by 2 level due to RoB (one test with final RoB score = 3).

1. NICE. CHTE methods review. Health-related quality of life. Task and finish group report. July 2020. www.nice.org.uk/Media/Default/About/what-we-do/our-programmes/nice-guidance/chte-methods-consultation/Health-related-quality-of-life-task-and-finish-group-report.docx. Accessed March 17, 2025.

2. Gamper EM, Cottone F, Sommer K, et al. The EORTC QLU-C10D was more efficient in detecting clinical known group differences in myelodysplastic syndromes than the EQ-5D-3L. J Clin Epidemiol. 2021;137:31-44.

3. Kvam AK, Fayers PM, Wisloff F. Responsiveness and minimal important score differences in quality-of-life questionnaires: a comparison of the EORTC QLQ-C30 cancer-specific questionnaire to the generic utility questionnaires EQ-5D and 15D in patients with multiple myeloma. Eur J Haematol. 2011;87(4):330-337.

4. Naik H, Howell D, Su S, et al. EQ-5D Health Utility Scores: Data from a Comprehensive Canadian Cancer Centre. Patient. 2017;10(1):105-115.

5. Rowen D, et al. Comparison of generic, condition-specific, and mapped health state utility values for multiple myeloma cancer. Value Health. 2012;15(8):1059-1068.

6. Yu H, Zeng X, Sui M, et al. A head-to-head comparison of measurement properties of the EQ-5D-3L and EQ-5D-5L in acute myeloid leukemia patients. Qual Life Res. 2021;30(3):855-866.

7. Cao Y, Li H, Cheng LJ, et al. A comparison of measurement properties between EORTC QLU-C10D and FACT-8D in patients with hematological malignances. Health Econ Rev. 2024;14(1):79.

8. Dong D, Jin J, Oerlemans S, et al. Validation of the Chinese EORTC chronic lymphocytic leukaemia module - application of classical test theory and item response theory. Health Qual Life Outcomes. 2020;18(1):96.

9. Herdman M, Kerr C, Pavesi M, et al. Testing the validity and responsiveness of a new cancer-specific health utility measure (FACT-8D) in relapsed/refractory mantle cell lymphoma, and comparison to EQ-5D-5L. J Patient Rep Outcomes. 2020;4(1):22.

10. Li L, Liu C, Cai X, et al. Validity and reliability of the EQ-5D-5 L in family caregivers of leukemia patients. BMC Cancer. 2019;19(1):522.

11. Li M, Fang B, Gu H, Jiang Y. EQ-5D-5L and SF-6Dv2 health utilities scores of diffuse large B-cell lymphoma patients in China. Health Qual Life Outcomes. 2024;22(1):80.

12. Peipert JD, Yount SE, Efficace F, et al. Validation of the Functional Assessment of Cancer Therapy-Leukemia instrument in patients with acute myeloid leukemia who are not candidates for intensive therapy. Cancer. 2020;126(15):3542-3551.

13. Rattanathammethee T, Wongkhut O, Punnachet T, et al. Psychometric Properties of MD Anderson Symptoms Inventory for Acute Myeloid Leukemia Patients in Thailand. Asian Pac J Cancer Prev. 2022;23(9):3167-3172.

14. van Dongen-Leunis A, Redekop WK, Uyl-de Groot CA. Which Questionnaire Should Be Used to Measure Quality-of-Life Utilities in Patients with Acute Leukemia? An Evaluation of the Validity and Interpretability of the EQ-5D-5L and Preference-Based Questionnaires Derived from the EORTC QLQ-C30. Value Health. 2016;19(6):834-843.

15. Xu RH, Zhao Z, Pan T, Monteiro A, Gu H, Dong D. Comparing the measurement properties of the EQ-5D-5 L, SF-6Dv2, QLU-C10D and FACT-8D among survivors of classical Hodgkin's lymphoma. Eur J Health Econ 2024.

16. Zhang A, Li J, Mao Z, et al. Psychometric performance of EQ-5D-5L and SF-6Dv2 in patients with lymphoma in China. Eur J Health Econ. 2024;25(9):1471-1484.