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

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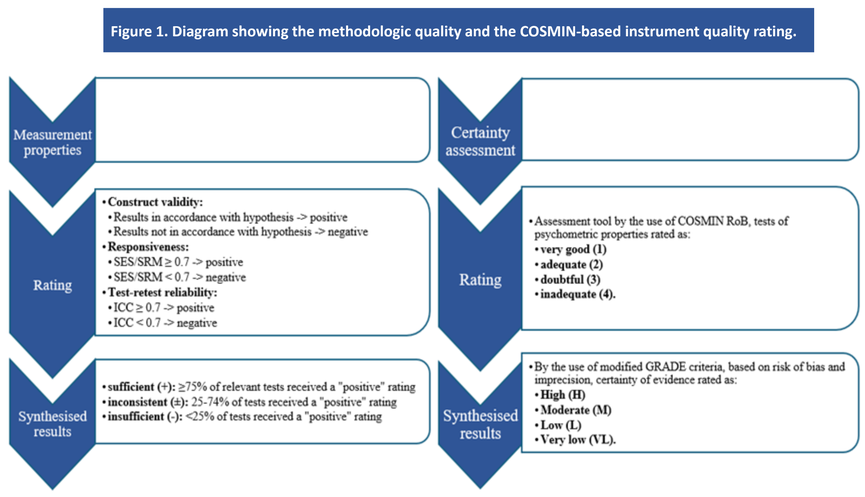
INTRODUCTION & OBJECTIVE

- 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 instrument 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 OMIs 2024 flow diagram.

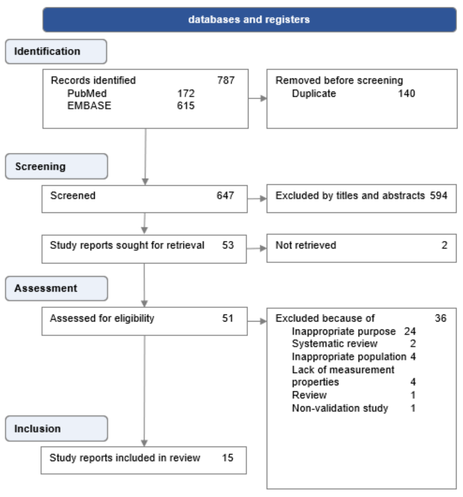


Table 1. Included articles and its characteristics (n=15).

Author (year)	Design of the study	Characteristics of population						Outcome			Measurement property			
		Disease	N	Age[a]	% male	Country	Language	DIM	EQ VAS	EQ Index	CV	KGV	TTR	R
EQ-5D-3L														
Gamper et al. (2021)	CS	MDS	619	72.2 (10.7)	61.1	3 count.[b]	Italian, English	X		X	X	X		
Kvam et al. (2011)	LONG	MM	239	66 [36-89]	53.6	Norway	Norwegian			X				X
Naik et al. (2017)	CS	HM[c]	259[d]	59 [18-100]	47.0	Canada	English			X		X		
Rowen et al. (2012)	LONG	MM	674	71.58 (5.25)	49.2	USA	English	X		X	X			
Yu et al. (2021)[e]	LONG	AML	168	44.8 (14.4)	54.8	China	Chinese	X		X	X	X	X	
EQ-5D-5L														
Cao et al. (2024)	LONG	HM[c]	308	nd	46.8	China	Chinese	X		X	X			
Dong et al. (2020)	CS	CLL	318	55.02 (nd)	61.9	China	Chinese	X			X			
Herdman et al. (2020)	CS	MCL	250	66.7 (9.3)	73.6	21 count.[f]	English		X	X	X	X		X
Li et al. (2019)	LONG	All LEUK	298	41.08 (10.8)	45.3	China	Chinese	X	X	X	X	X	X	
Li et al. (2024)	CS	DLBCL	582	48.95 (nd)	47.3	China	Chinese	X		X	X	X		
Peipert et al. (2020)	CS	AML	317	75 (5)	54.3	15 count.[g]	English	X	X	X	X			X
Rattanathammethee et al. (2022)	CS	AML	20	45.9 (18.9)	45.0	Thailand	Thai	X			X			
van Dongen-Leunis et al. (2016)	CS	AML	111	51 (13.4)	52.3	Netherlands	Dutch	X	X	X	X	X		
Xu et al. (2024)	CS	HL	534	35.6 (nd)	48.5	China	Chinese	X		X	X	X		
Yu et al. (2021)[e]	LONG	AML	168	44.8 (14.4)	54.8	China	Chinese	X		X	X	X	X	
Zhang et al. (2024)	CS	All LYMPH	200	58.37 (14.30)	58.0	China	Chinese	X	X	X	X	X	X	

AML acute myeloid leukaemia; *CLL* chronic lymphocytic leukaemia; *count.* countries; *CS* cross-sectional; *CV* convergent validity; *DIM* dimensions; *DLBCL* diffuse large B-cell lymphoma; *HL* Hodgkin's lymphoma; *HM* haematological malignancies; *Index* EQ-5D Index; *KGV* known-groups validity; *LEUK* leukaemias; *LONG* longitudinal; *LYMPH* lymphomas; *MCL* mantle cel lymphoma; *MDS* myelodysplastic syndromes; *MM* multiple myeloma; *N* numer of patients; *NHL* non-Hodgkin's lymphoma; *R* responsiveness; *TTR* test-retest reliability; *VAS* visual analogue scale;
[a] Data are mean (SD) or median [range];
[b] Italy, Australia, UK;
[c] Lymphomas, leukaemias, multiple myeloma;
[d] Number of patients with haematological malignancies; the total number of patients in study was 1,929;
[e] In You et al. study both EQ-5D-3L and EQ-5D-5L were used;
[f] Belgium, Brazil, Canada, Chile, Colombia, Czechia, France, Germany, Hungary, Ireland, Korea, Mexico, Netherlands, Poland, Portugal, Russian Federation, Spain, Sweden, Taiwan, Ukraine, United Kingdom;
[g] Australia, Belgium, France, Germany, Israel, Korea, Poland, Russian Federation, Spain, Sweden, Taiwan, Turkey, United Kingdom, United States.

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

	EQ-5D-5L Index			EQ-5D-5L dimensions		
	Papers (tests), n	MP (positive tests), %	CoE (N)	Papers (tests), n	MP (positive tests), %	CoE (N)
Total	8 (129)	+ (93%)	H (2,451)	10 (420)	+ (100%)	H (2,856)
Disease						
HM[a]	1 (1)	+ (100%)	H (308)	1 (90)	+ (100%)	H (308)
Leukaemias	3 (83)	+ (96%)	H (577)	6 (183)	+ (100%)	H (1,232)
AML	2 (76)	+ (96%)	H (279)	4 (140)	+ (100%)	H (616)
CLL	-	-	-	1 (18)	+ (100%)	H (318)
Lymphomas	4 (45)	+ (86%)	H (1,566)	3 (147)	+ (100%)	H (1,316)
HL	1 (8)	+ (100%)	H (534)	1 (12)	+ (100%)	H (534)
DLBCL	1 (10)	+ (90%)	H (582)	1 (30)	+ (100%)	H (582)
MCL	1 (20)	+ (90%)	H (250)	-	-	-
Country						
China	6 (57)	+ (93%)	H (2,090)	7 (300)	+ (100%)	H (2,408)
Netherlands	1 (52)	+ (94%)	H (111)	1 (80)	+ (100%)	H (111)
Thailand	-	-	-	1 (24)	+ (100%)	L (20)[b]
Multicountry studies	1 (20)	+ (90%)	H (250)	1 (16)	+ (100%)	H (317)
Language						
Chinese	6 (57)	+ (93%)	H (2,090)	7 (300)	+ (100%)	H (2,408)
Dutch	1 (52)	+ (94%)	H (111)	1 (80)	+ (100%)	H (111)
English	1 (20)	+ (90%)	H (250)	1 (16)	+ (100%)	H (317)
Thai	-	-	-	1 (24)	+ (100%)	L (20) [b]

AML acute myeloid leukaemia; *CLL* chronic lymphocytic leukaemia; *CoE* certainty of evidence; *DLBCL* diffuse large B-cell lymphoma; *H* high; *HL* Hodgkin's lymphoma; *HM* haematological malignancies; *L* low; *MCL* mantle cel lymphoma; *MP* overall rating of measurement properties; *N* numer of respondents; *RoB* risk of bias;
[a] Leukaemias, lymphomas, multiple myeloma;
[b] certainty of evidence downgraded by 2 levels due to imprecision (sample size <50).

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

	EQ-5D-5L Index			EQ-5D-5L dimensions		
	Papers (tests), n	MP (positive tests), %	CoE (N)	Papers (tests), n	MP (positive tests), %	CoE (N)
Total	3 (3)	+ (100%)	M[a] (666)	2 (10)	+ (80%)	H (466)
Disease						
Leukaemias	2 (2)	+ (100%)	H (466)	2 (10)	+ (80%)	H (466)
Lymphomas	1 (1)	+ (100%)	L[b](200)	-	-	-
Language						
Chinese	3 (3)	+ (100%)	M[a] (666)	2 (10)	+ (80%)	H (466)

CoE certainty of evidence; *H* high; *L* low; *M* moderate; *MP* overall rating of measurement properties; *N* numer of respondents; *RoB* risk of bias;
[a] Quality downgraded by 1 level due to RoB (67% of studies with at least adequate methodological quality);
[b] Quality downgraded by 2 level due to RoB (one test with final RoB score = 3).

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

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