

HEALTH POLICY

A head-to-head comparison of the EQ-5D-5L and 15D descriptive systems and index scores in a general population sample

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15D

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OBJECTIVES

The EQ-5D-5L and 15D are generic preference-accompanied health status measures with similar dimensions. In this study, we aim to compare the measurement properties of the EQ-5D-5L and 15D descriptive systems and index scores in a large general population sample.

Figure 1.

Heatmap showing Spearman's rank correlation between EQ-5D-5L and 15D dimensions Sexual activity 0.334 0.374 0.268 0.428 0.430 0.492 Vitality 0.380 0.275 0.460 0.541 0.218 0.168 0.293 0.416 0.642 Distress 0.218 0.228 0.309 0.410 0.690 Depression Discomfort and symptoms Mental function 0.6 0.472 0.411 0.308 0.447 0.583 0.240 0.293 0.299 0.322 0.372



In August 2021, an online cross-sectional survey was conducted in a nationally representative adult general population sample in Hungary (n=1887). The EQ-5D-5L and 15D descriptive systems and index scores were compared in terms of ceiling and floor effects, informativity (Shannon's evenness index), agreement, convergent validity and known-groups validity for 20 different chronic physical and mental health conditions. Danish value sets were used to compute index scores for both instruments.



Among the corresponding dimensions, both the ceiling and floor effects were smaller for the EQ-5D-5L in most dimension pairs (exceptions: EQ-5D-5L anxiety/depression vs. 15D distress for the

EQ-5D-5L dimensions								
	Mobility	Self-care	Usual activities	Pain/ discomfort	Anxiety/ depression			
Mobility	0.558	0.459	0.534	0.405	0.220			
Vision	0.295	0.271	0.310	0.310	0.260			
Hearing	0.236	0.288	0.258	0.230	0.176			
Breathing	0.388	0.301	0.412	0.372	0.293	0.2		
Sleeping	0.280	0.209	0.311	0.446	0.431			
Eating	0.115	0.300	0.179	0.122	0.165	0.3		
Speech	0.154	0.285	0.230	0.191	0.277			
Excretion	0.274	0.229	0.296	0.340	0.264	0.4		
Usual activities	0.480	0.459	0.619	0.481	0.357			

In most cases, the EQ-5D-5L was able to better discriminate between healthy respondents and those with chronic diseases; however, the difference in relative efficiency was insignificant in 36/41 condition groups (exceptions: dementia, other physical health conditions, bipolar depression, thyroid diseases and gastroesophageal reflux disease) **(Table 2)**.

Table 2.

Known-groups validity of the EQ-5D-5L and 15D in some physical and mental health conditions

floor effect, and EQ-5D-5L anxiety/depression vs. 15D depression for the ceiling effect) **(Table 1)**. For the rest of the 15D dimensions, the floor varied between 0.2 and 3.9%, while the ceiling between 50.3 and 94.4%.

Table 1.

Floor and ceiling of EQ-5D-5L and 15D among the corresponding dimensions

EQ-5D-5L dimensions	Ceiling, %	Floor, %	15D dimensions	Ceiling, %	Floor, %
Mobility (walking)	66.0	0.4	Mobility (walking, moving about)	78.0	0.7
Usual activities (e.g. work, study, housework, family or leisure activities)	73.8	0.2	Usual activities (e.g. employment, studying, housework, free-time activities)	77.7	0.4
Pain/discomfort	50.8	0.5	Discomfort and symptoms (e.g. pain, ache, nausea, itching etc.)	68.2	0.5
Anxiety/depression	60.8	1.2	Depression (sad, melancholic or depressed)	68.6	1.1

	n (%)	RE a	95% CI ^b
Healthy	383 (20.3)	-	-
Hypertension	527 (27.9)	1.071	0.884-1.365
Musculoskeletal diseases	461 (24.4)	1.092	0.930-1.350
Smoking addiction	381 (20.2)	1.096	0.896-1.442
Allergies	318 (16.9)	1.119	0.893-1.517
Cardiovascular disease	259 (13.7)	1.048	0.893-1.260
Gastrointestinal or hepatic disease	241 (12.8)	1.111	0.924-1.389
Hyperlipidaemia	240 (12.7)	1.056	0.869-1.334
Eye or visual diseases	231 (12.2)	0.971	0.813-1.170
Diabetes	205 (10.9)	1.152	0.930-1.502
Gastroesophageal reflux disease	186 (9.9)	1.251	1.012-1.619
Respiratory diseases	175 (9.3)	0.952	0.763-1.227
Arrhythmias	172 (9.1)	1.112	0.913-1.389
Anxiety, phobia, or panic disorder	172 (9.1)	1.075	0.910-1.308
Thyroid diseases	171 (9.1)	1.269	1.007-1.689
Sleeping disorders	169 (9.0)	1.164	0.969-1.440
Skin diseases	166 (8.8)	1.074	0.867-1.402
Headache, migraine	139 (7.4)	1.19	0.961-1.499
Hearing impairment	133 (7.1)	1.174	0.959-1.515
Other physical health conditions	92 (4.9)	1.448	1.075-2.008
Bipolar depression	35 (1.9)	1.385	1.019-1.859
Dementia	18 (1.0)	1.465	1.035-2.085

CI confidence intervals, RE relative efficiency.

^a Relative efficiency compared to 15D.

^b 2000 bootstrap samples with accelerated bias correction.

Distress	(anxious,	55 9	1 .
stressed or nervous)		55.5	• •

The 15D index scores showed a smaller ceiling effect than the EQ-5D-5L (21% vs. 36%). The average informativity was better for the EQ-5D-5L dimensions (0.56 vs. 0.49). A strong correlation was found between the EQ-5D-5L and 15D index scores (Pearson's r=0.671), while their agreement was poor (ICC=0.363, 95% CI: 0.342-0.385). We found that corresponding dimensions correlated strongly and moderately, while the non-corresponding dimension pairs were correlated mostly weakly (Figure 1).

Funding: The data collection was supported by the Higher Education Institutional Excellence Program 2020 of the Ministry of Innovation and Technology in the framework of the Financial and Public Services research project (TKP2020-IKA-02) at the Corvinus University of Budapest. Anna Nikl's work was supported by the Higher Education Institutional Excellence Program 2020 of the Ministry of Innovation and Technology in the framework of the Financial and Public Services research project (TKP2020-IKA-02) at the Corvinus University of Budapest. Fanni Rencz's work was supported by the János Bolyai Research Scholarship of the Hungarian Academy of Sciences (BO/00304/21) and the New National Excellence Program of the Ministry for Innovation and Technology from the source of the National Research, Development and Innovation Fund (ÚNKP-22-5-CORVINUS-4).

FONCLUSIONS

This is the first study to compare the measurement properties of the EQ-5D-5L and 15D in a general population sample. The EQ-5D-5L performs better than the 15D for most measurement properties. Our findings help to understand the differences between the EQ-5D-5L and 15D instruments and index scores and provide broad information for health economic evaluations and resource allocation decisions.

References:

- 1. Jensen CE, Sørensen SS, Gudex C, Jensen MB, Pedersen KM, and Ehlers LH. The Danish EQ-5D-5L Value Set: A Hybrid Model Using cTTO and DCE Data. Appl Health Econ Health Policy, 2021. **19**(4): p. 579-591.
- 2. Wittrup-Jensen KU and Pedersen KM. *Modelling Danish weights for the 15D quality of life questionnaire by applying multi-attribute utility theory (MAUT)*. 2008: Syddansk Universitet.