The EQ Health and Wellbeing (EQ-HWB) and The EQ Health and Wellbeing Short (EQ-HWB-S) as an outcome measure in mental health and well-being: a comparison to the EQ-5D-5L, EQ-5D-3L and the Short Warwick-Edinburgh Mental Well-being Scale

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INTRODUCTION

- The extent to which generic measures are sensitive to capturing changes in symptoms, functioning, and quality of life that are of relevance to people with mental health (MH) problems has been the subject of debate [1].

- EQ Health and wellbeing long form (EQ-HWB) and short form (EQ-HWB-S) measures have been developed internationally for evaluating interventions in health, public health, and social care [2].

- The EQ-HWB/EQ-HWB-S are intended to broadly capture aspects of health and well-being that may be missed by existing generic measures as well as compared to other measures intended to capture mental well-being such as the Short Warwick-Edinburgh mental well-being scale (S-WEMWBS).

OBJECTIVES

This study aims to **examine and compare the measurement properties of EQ-HWB/EQ-HWB-S in relation to the EQ-5D-5L, EQ-5D-3L, and S-WEMWBS** with respect to MH conditions focusing on:

(1) content overlap between EQ-HWB/EQ-HWB-S and EQ-5D with mental well-being measure S-WEMWBS, and

(2) psychometric properties of EQ-HWB/EQ-HWB-S in relation to the EQ-5D-5L, EQ-5D-3L, and S-WEMWBS in terms of response distributions, convergent validity, and discriminative ability in patients with any mental health condition, including more common conditions - clinical depression and generalized anxiety disorder (GAD).

METHODS

- Online panel survey of US-based respondents, quota sampled by age and sex, completed in 2019.

- Respondents completed EQ-HWB/-S Experimental Version, EQ-5D-3L/-5L, S-WEMWBS and questions about health status, including self-reported chronic physical and mental health conditions.

- EQ-HWB/EQ-HWB-S were scored using a non-preference-based scoring approach under development that supports the use of a level summary score (LSS) divided into three LSSs subscale: psychosocial, pain/discomfort, and activities with 2 items ("See" and "Hear") excluded [3]. S-WEMWBS summary score has been transformed to interval scale using Rasch analysis [4], while US-based value sets were applied to generate EQ-5D-3L [5] and EQ-5D-5L [6] index scores.

- The analysis examined:
  - Patterns of response (acceptability, distributions, floor and ceiling effects), where ceiling effects defined as >50% of the respondents scored at the minimum or maximum level;
  - Content overlap between PROMs based on the analysis of items using the Jaccard Index [7].
  - Construct validity included strength of correlation between related items/constructs (using Spearman correlation coefficient interpreted according to Cohen's guidelines7, i.e., "strong" (≥0.51), "moderate" (0.31-0.50), "weak" (0.11-0.30), and "none" (0-0.10)) [8].
  - Discriminative validity using known group comparisons where effect sizes (ES) was used to quantify the magnitude of the difference between each predefined known group (interpreted to the Cohen's thresholds: small ES (d=0.2-0.49), medium ES (d=0.5-0.79), large ES (d=0.8-1.19) and very large ES (d=1.20≥) [9].

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RESULTS

- The dataset included 172 participants who self-reported any mental health problems, out of those 113 clinical depression, and 98 generalized anxiety disorder (Table 1).

- Most content overlap measured with Jaccard Index was found between EQ-HWB-S and S-WEMWBS (33%).

- Strong associations (rs > 0.5) were found between conceptually overlapping/related items of S-WEMWBS and EQ-HWB. EQ-HWB psychosocial LSS was strongly correlated with S-WEMWBS summary score (rs = -0.70) meaning worse psychosocial status on EQ-HWB is associated with worse mental well-being, followed by EQ-HWB-S summary score (rs = -0.62). On the other hand, EQ-5D index scores were only moderately correlated with S-WEMWBS summary scores (rs = 0.4 and rs = 0.45 for 5L and 3L respectively) (Table 2.)

- EQ-HWB and EQ-HWB-S LSS exhibited very large ES (i.e., d ≥ 1.2) across all MH conditions, while other measures (EQ-5D-5L, 3L, and S-WEMWBS) exhibited large ES (i.e., d ≥ 0.8) to very large ES in GAD. Specifically, the EQ-HWB-psychosocial LSS showed the largest ES for patients with/without any MH condition (d = 1.34) and clinical depression (d = 1.37).

Table 1. Respondent characteristics

Characteristic		Any Mental Health Condition (n=172)	Clinical Depression (n=113)	Generalized Anxiety Disorder (n=98)	Other Mental Health Conditions (n=52)
		n (%)	n (%)	n (%)	n (%)
Age	mean (SD)	46.22 (15.09)	46.42 (15.98)	44.34 (14.78)	39.92 (11.98)
Gender	Male	59 (34.3)	37 (32.74)	30 (30.61)	18 (34.62)
	Female	112 (65.12)	75 (66.37)	68 (69.39)	34 (65.38)
	Other	1 (0.58)	1 (0.88)	0 (0)	0 (0)
Race	White	154 (89.53)	101 (89.38)	88 (89.8)	46 (88.46)
	Black	16 (9.3)	11 (9.73)	7 (7.14)	6 (11.54)
	Indian	1 (0.58)	1 (0.88)	1 (1.02)	0 (0)
	Native American	9 (5.23)	8 (7.08)	5 (5.1)	3 (5.77)
	Other Asian	2 (1.16)	2 (1.77)	1 (1.02)	0 (0)
	Other	4 (2.33)	3 (2.65)	3 (3.06)	3 (5.77)
	Pacific Islander	0 (0)	0 (0)	0 (0)	0 (0)
Hispanic	Yes	29 (16.86)	17 (15.04)	17 (17.35)	7 (13.46)
HRQL and well-being		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
EQ-HWB	psychosocial	46.00 (15.44)	48.00 (15.88)	48.40 (15.43)	49.53 (16.12)
	pain, discomfort	11.28 (3.84)	11.26 (3.85)	11.84 (3.67)	11.02 (4.02)
	activities	6.41 (2.76)	6.64 (2.72)	6.62 (2.67)	6.38 (2.91)
EQ-HWB-S LSS		24.86 (8.22)	25.7 (8.24)	26.54 (8.07)	25.84 (8.83)
EQ-5D-5L index score		0.56 (0.31)	0.55 (0.26)	0.51 (0.32)	0.55 (0.36)
EQ-5D-3L index score		0.64 (0.21)	0.62 (0.21)	0.6 (0.22)	0.64 (0.25)
EQ VAS		59.19 (23.22)	57.23 (22.7)	56.28 (23.22)	60 (25.44)
Short-WEMWBS		20.05 (4.94)	19.49 (4.37)	19.31 (4.79)	19.19 (5.12)

Table 2. Correlations between the S-WEMWBS summary score and EQ-HWB, EQ-HWB-S and EQ-5D.

	EW-HWB (psychosocial)	EQ-HWB (pain/discomfort)	EQ-HWB (activities)	EQ-HWB-S	EQ5D5L	EQ5D3L	EQ VAS	Short-WEMWBS
EW-HWB psychosocial subscale	1							
EQ-HWB pain/discomfort subscale	0.48	1						
EQ-HWB activities subscale	0.54	0.63	1					
EQ-HWB-S	0.94	0.61	0.7	1				
EQ-5D-5L	-0.56	-0.7	-0.76	-0.69	1			
EQ-5D-3L	-0.61	-0.63	-0.67	-0.67	0.8	1		
EQ VAS	-0.57	-0.55	-0.55	-0.57	0.67	0.6	1	
Short-WEMWBS	-0.7	-0.32	-0.35	-0.62	0.4	0.45	0.45	1

Spearman's correlation coefficient — None 0 – 0.10 | Weak 0.11 – 0.30 | Moderate 0.31 – 0.50 | Strong 0.51≥

Table 3. Comparison of measures based on known groups comparisons for self-reported mental health conditions

Instrument / Variable for KGV	Any mental health problem (Yes/No)		Clinical depression (Yes/No)		Generalized anxiety disorder (Yes/No)		Other mental condition (Yes/No)	
	ES	95% CL	ES	95% CL	ES	95% CL	ES	95% CL
EQ-HWB-S	1.33	1.10-1.55	1.32	1.05-1.59	1.41	1.09-1.68	1.16	0.76-1.53
EQ-HWB-psychosocial	1.34	1.09-1.58	1.37	1.08-1.65	1.37	1.09-1.67	1.3	0.89-1.69
EQ-HWB-pain/discomfort	1.01	0.8-1.21	0.85	0.61-1.09	1.05	0.78-1.3	0.79	0.44-1.15
EQ-HWB-activities	0.76	0.55-1.00	0.80	0.56-1.08	0.86	0.58-1.14	0.62	0.20-0.99
EQ-5D-5L	1.19	1.44-0.93	1.11	1.39-0.81	1.33	1.64-0.99	0.92	1.39-0.45
EQ-5D-3L	1.2	1.47-0.96	1.14	1.41-0.87	1.27	1.57-0.98	0.91	1.34-0.48
S-WEMWBS	0.91	1.08-0.74	0.92	1.09-0.73	0.94	1.14-0.74	0.91	1.18-0.64

ES (Cohen's d) — None 0 – 0.19 | Small 0.20 – 0.49 | Medium 0.50 – 0.79 | Large 0.80 – 1.19 | Very Large 1.20 ≥

CONCLUSION

- Initial evidence **supports the validity of the EQ-HWB and EQ-HWB-S as outcome measures in mental health and well-being.**

- All measures demonstrated discriminative ability, with the **EQ-HWB psychosocial level summary score and EQ-HWB-S tending to outperform both the S-WEMWBS and EQ-5D-5L/EQ-5D-3L** in terms of known groups based on mental health highlighting its **future potential as a measure of mental health using a psychometrically derived summary score.**

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