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Patient-Reported Outcomes

Psychometric Properties of the Modified EQ Health and Wellbeing and its Shorter Version in a General Chinese Population: A Comparative Analysis With EQ-5D-5L, SF-6Dv2, ICEpop CAPability measure for Adults, Short Version of Warwick-Edinburgh Mental Wellbeing Scale, and World Health Organization Well-Being Index 5-Item

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ABSTRACT

Objectives: The Modified EQ Health and Wellbeing (EQ-HWB) and its shorter version (EQ-HWB-S) are new health and well-being measures nearing finalization. Since the 2022 version, the development group has proposed revisions to the item order, response levels, and wording. This study aimed to assess the psychometric properties of the modified Simplified Chinese EQ-HWB and EQ-HWB-S and compare their performance with other measures.

Methods: The data were collected through a web-based survey of the Chinese general population (n = 1053). Outcome measures included the modified EQ-HWB, EQ-5D-5L, SF-6Dv2, ICEpop CAPability measure for Adults, short version of Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS), and World Health Organization Well-Being Index 5-Item. We examined psychometric properties, such as distributional characteristics (ceiling and floor), convergent (correlations), known-group (effect sizes), and structural validity (principal component analysis).

Results: At the instrument level, neither the modified EQ-HWB nor EQ-HWB-S showed ceiling effect. The response distribution of the 3 items (enjoyable activities, excluded by others, and negative feelings about oneself) modified from positively to negatively framed was in the range of the other items. The EQ-HWB "getting around inside or outside," "day-to-day activities," and "enjoyable activities" items showed only moderate correlations with the corresponding EQ-5D-5L and SF-6Dv2 dimensions (rho = 0.31-0.36). The EQ-HWB items mainly loaded on separate factors from the ICEpop CAPability measure for Adults, short version of Warwick-Edinburgh Mental Wellbeing Scale, and World Health Organization Well-Being Index 5-Item items. The EQ-HWB effectively differentiated between sociodemographic and health-related known groups with larger effect sizes than the EQ-HWB-S.

Conclusions: The modified EQ-HWB and EQ-HWB-S demonstrated mixed psychometric performance. Several modified items showed improved distributional characteristics compared with earlier findings with the original EQ-HWB. However, item-level correlations were somewhat weaker than those reported in previous studies using the original version.

Keywords: EQ-5D-5L, EQ Health and Wellbeing, ICECAP-A, preference-accompanied measure, psychometric properties, SF-6Dv2.

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Highlights

- To our knowledge, this is the first study that examines the psychometric properties of the modified version of the Modified EQ Health and Wellbeing (EQ-HWB) and its shorter version (EQ-HWB-S).
- The revised wording showed mixed psychometric performance. Changing positively framed items to negatively framed ones resulted in a similar response distribution to the other items. Most item-level correlations were weaker than those in previous studies using the original version. The EQ-HWB items mainly loaded on separate factors from the other measures, indicating that they measure different aspects of well-being.
- The EQ-HWB/S are valuable instruments that complement the other well-being measures, which have limited ability to measure changes in physical health. Future studies are recommended to directly compare the original and modified items for informing decisions about finalizing the descriptive system.

Introduction

The EQ Health and Well-being (EQ-HWB) is a newly developed generic measure consisting of 7 dimensions. It intends to measure not only health-related quality of life (HRQoL) but also carer- and social-care-related quality of life.[1] The EQ-HWB was developed under the "Extending the QALY project," cofunded by the UK Medical Research Council and the EuroQol Research Foundation.[2] Its development underwent a rigorous process, fully considering input from patients, carers, and social care users to reflect quality-of-life aspects important to them.[1,3-6] Currently, there are 2 versions: the EQ-HWB full version with 25 items and the shorter EQ-HWB-S representing 9 of the 25 items. The EQ-HWB is a profile measure, whereas the EQ-HWB-S is a preference-accompanied measure, which can support decision making in health, public health, and social care. A recent study in the United Kingdom has generated a pilot value set for the EQ-HWB-S based on public preferences.[6]

The EQ-HWB and EQ-HWB-S are currently experimental instruments; therefore, their descriptive systems are not yet

finalized. Since the 2022 publication of the experimental version,[1] the findings from numerous validation studies initiated by the EuroQol Group members and collaborators[7-11] have led the instrument developer team to propose smaller changes to the descriptive system. A summary of all proposed modifications is provided in Appendix 1 in Supplemental Materials found at https://doi.org/10.1016/j.jval.2025.04.2151. Briefly, these changes affect the instructions, ordering, and wording of items (eg, "getting around inside and outside" has been replaced with "getting around inside or outside"), as well as the response levels (eg, changing "only occasionally" to "a little of the time"). Notably, 3 positively framed items are proposed to be changed to negatively framed ones to align with the rest of the items (eg, "feel good about yourself" has been revised as "have negative feelings about yourself"). Many of the proposed modifications are particularly relevant for the Chinese language because the affected items were previously found to be problematic in qualitative testing in China.[12] Throughout this article, we refer to the published 2022 experimental version of EQ-HWB as "original" and the version that includes the modifications proposed in 2024 as "modified."

Importantly, every modification needs thorough testing across multiple populations and languages to enable the instrument developer group to select the version that will become the final, approved version of the instrument. In parallel to these changes, there is a growing body of literature on the psychometric properties of the original EQ-HWB or EQ-HWB-S, including comparisons with EQ-5D-5L,[7-9] carer-related instruments (ie, Adult Social Care Outcomes Toolkit-Carer and CarerQoL),[11] and satisfaction with life and mental health scales.[10] However, evidence about their comparative measurement performance with other widely used HRQoL (eg, SF-6D) and well-being instruments (eg, ICEpop Capability Measure for Adults, ICECAP-A) is still lacking for many populations (eg, Asian populations) and patient groups.

This study therefore has 2 objectives. First, it aims to assess the psychometric performance of the modified EQ-HWB and EQ-HWB-S in the Chinese general population. Second, it seeks to compare psychometric properties of modified EQ-HWB and EQ-HWB-S with 5 widely used generic measures of HRQoL or well-being: EQ-5D-5L, SF-6Dv2, short version of Warwick-Edinburgh Mental Well-being Scale (SWEMWBS), ICECAP-A, and World Health Organization Well-Being Index 5-item (WHO-5).

Methods

Data

This study used data from a web-based cross-sectional survey that was conducted among members of the Chinese general population between April and May 2024. Participants were recruited through Wenjuanxing, a Chinese survey company with an online panel of over 2.6 million members. Inclusion criteria were those (1) aged between 18 and 80 years, (2) able to read and speak Chinese, and (3) could provide informed consent. We did not aim for a representative sample in terms of socio-demographics; instead, we intended to ensure heterogeneity within the sample for psychometric analyses by setting quotas, particularly to ensure that older adults (30% ≥50 years with 15% of them ≥60 years) were sufficiently represented. To ensure a complete data set for assessing the psychometric properties of the EQ-HWB and EQ-HWB-S, all questions were made mandatory. The order of the questionnaires within the survey was fixed (EQ-HWB, EQ-5D-5L, SWEMWBS, ICECAP-A, SF-6DV2, and WHO-5) and was followed by socio-demographics.

Several methods were implemented to ensure data quality, such as use of a completely automated public Turing test to tell computers and humans apart (CAPTCHA) to prevent bot submissions, time analysis to exclude implausibly rapid responses, limit of 1 submission per IP address within a set time frame, and identification of and filtering parallel-generated response patterns. The study protocol was approved by the ethics committee of the Institutional Review Board of the Hong Kong Polytechnic University (Ref No.: HSEARS20240917004), and written informed consent was collected from all participants.

Outcome Measures

EQ-HWB modified version

We used the official modified Simplified Chinese versions of the EQ-HWB (-S), as obtained from the EuroQol Research Foundation through a collaborator agreement. The EQ-HWB developer team proposed modifications for the UK English version of the EQ-HWB (see Appendix 1 in Supplemental Materials found at https://doi.org/10.1016/j.jval.2025.04.2151). Our research team translated the modified version into Simplified Chinese and performed cultural adaptation through cognitive debriefing, under supervision and approval from the Version Management Committee of EuroQol as part of another project,[13] and the same version was used for this project. The modified EQ-HWB comprises 25 items, in which participants rate each item on a 5-level scale, reflecting on "the last 7 days." In this study, participants only answered the 25-item modified EQ-HWB, from which we derived the modified EQ-HWB-S responses. Following previous psychometric studies with various EuroQol instruments, we calculated level sum scores (LSSs) for the EQ-HWB and converted them to a scale of 0 to 100, in which a higher score indicates a better health and well-being.[14-18] Although an experimental value set of EQ-HWB-S was developed in the United Kingdom,[6] it was based on the original version with different wording. Therefore, we opted to use LSSs for the modified EQ-HWB-S in this study.

EQ-5D-5L

The EQ-5D-5L generic preference-accompanied measure consists of 2 parts: a 5 dimensional descriptive system (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) and a vertical visual analog scale (EQ VAS), with endpoints of 0 (the worst health you can imagine) and 100 (the best health you can imagine).[19] Both the Chinese (range: −0.391 to 1)[20] and UK crosswalk (range: −0.594 to 1)[21] value sets were used to calculate index values from the descriptive system responses, allowing for comparisons with other instruments that have only UK value sets. The recall period of both the descriptive system and EQ VAS is "today."

SF-6Dv2

The SF-6Dv2 is a generic preference-accompanied HRQoL measure consisting of 6 dimensions (physical functioning, role limitations, social functioning, pain, mental health, and vitality).[22] Participants were asked to indicate their health status over the past 4 weeks across 6 dimensions. Each dimension has 5 response levels, except for pain, which has 6 levels. Both Chinese and English value sets of the SF-6Dv2 (range: −0.277 to 1 and −0.574 to 1, respectively) were available and used to calculate the index values in this study.[23,24]

ICECAP-A

The ICECAP-A is a well-being measure that assesses an adult's capability well-being at the moment.[25] It comprises 5 attributes: stability, attachment, autonomy, achievement, and enjoyment,

each with 4 response levels. The ICECAP-A has been previously translated, cross-culturally adapted, and tested in Chinese.[26] In the absence of a Chinese value set, we calculated the ICECAP-index values using the UK version.[27] The index values range from 0 (no capability) to 1 (full capability).

SWEMWBS

SWEMWBS is the short version of the Warwick-Edinburgh Mental Well-being Scale (WEMWBS).[28] It uses 7 statements from the WEMWBS, each with 5 response levels, to assess mental well-being over the past 2 weeks. Sun et al[29] have established the validity of the SWEMWBS in the Chinese population. Given the lack of a Chinese value set, we used the UK version (range: −0.09 to 1.008).[30]

WHO-5

The WHO-5 is a widely used and validated tool for assessing psychological well-being over past 2 weeks.[31,32] Each of its 5 items is scored from 0 ("at no time") to 5 ("all of the time"), with higher scores indicating indicate greater level of well-being. Overall scores of WHO-5 were transformed to range between 0 and 100. Previously, the Chinese version of the WHO-5 has demonstrated good psychometric properties.[33]

Background information

Individuals' background information, including sex, age, educational level, marital status, employment, perceived socioeconomic status (SES), and history of chronic disease, was collected.

Statistical Analysis

R software was used to perform all of the analyses. Counts and relative frequencies were used to describe the participants' background characteristics and responses on each outcome measure. Mean, standard deviation (SD), and median scores or index values were computed for all included outcome measures. We primarily assessed the psychometric performance of the EQ-HWB and EQ-HWB-S and then compared it with the other instruments as well. The significance level of statistical tests was set at $P < .05$.

Distributional characteristics

Ceiling and floor effects were examined at both the item level and scale level. At the item level, the proportion of respondents reporting the best (ceiling) and worst (floor) response levels was determined. At the scale level, we computed the relative frequency of participants with the best (ceiling) and worst (floor) profiles (eg, for EQ-HWB-S, "111111111" and "555555555," respectively). A threshold of 70% was used at the item level, following previous EQ-HWB validation studies,[2,5] whereas a 15% threshold was applied at the scale level.[34] Score or index value distributions for all instruments were displayed on histograms.

Convergent validity

Convergent validity was tested to assess the strength of relationships between items aiming to measure similar constructs, as well as between different instruments. We used Spearman's rank-order correlations between items (rho ≤ 0.29, weak; ≤0.49, moderate; and ≥0.5, strong).[35] At the instrument level, Pearson's correlation (r ≤ 0.29, weak; ≤0.49, moderate; and ≥0.5 strong) was used for index values and LSSs.[35] To facilitate easier interpretation of the correlation coefficients, we recoded all SWEMWBS responses so that a higher score indicated a worse status, aligning its order with other measures.

We hypothesized at least moderate correlations between conceptually overlapping items. For example, "pain" of EQ-HWB and "pain/discomfort" of EQ-5D-5L, "sad/depression" of EQ-HWB and "mental health" of SF-6Dv2, "hopeless" of EQ-HWB and "optimistic" of the SWEMWBS, and "control" of EQ-HWB and "stability" of ICECAP-A. At the instrument level, we expected strong correlations among LSSs/index values of included measures.

Known-group validity

Known-group validity tests assessed the ability of EQ-HWB and EQ-HWB-S to distinguish between participant groups. The known groups were defined by educational level (secondary or below/tertiary), perceived SES (lower than average/equal to average/higher than average), chronic disease status (yes/no), and 6 common chronic conditions (hypertension, high cholesterol, diabetes, arthritis, ophthalmopathy, and gastrointestinal disease). Each of the 6 chronic disease groups were compared with healthy respondents (ie, those with no chronic diseases). Analysis of variance was used to compare the mean differences in scores or index values between the known groups. Cohen's d (2-group comparison, ≥0.8 large, 0.5-0.79 medium, and 0.2-0.49, small) and Eta^2 (3-group comparison, ≥0.14 large, 0.06-0.13 medium, and 0.01-0.05, small) were calculated to reflect the measures' effect size (ES).[35] We hypothesized that participants with higher educational levels, higher SES, and no chronic diseases would report better HRQoL and well-being on all instruments.

Structural validity

Principal component analysis (PCA) was conducted using all items of all instruments (EQ-HWB, EQ-5D-5L, SF-6D, ICECAP-A, SWEMWBS, and WHO-5) to investigate whether these measures' items reveal similar underlying constructs.[36] To assess the adequacy of data for factor analysis, we conducted the Kaiser-Meyer-Olkin > 0.9 and Bartlett's tests ($P < .05$). Then, using varimax rotation, we determined the number of factors based on Kaiser's criterion (ie, all factors with an eigenvalue > 1 were retained).[36] Factor loadings were interpreted according to the following cut-off values: unacceptable (≤0.32), poor (0.33-0.44), fair (0.45-0.54), good (0.55-0.62), very good (0.63-0.70), and excellent (≥0.71).[37]

Results

Participant's Characteristics

A total of 1053 participants completed the questionnaire (response rate: 88.4%). The sample showed good representativeness in terms of age and sex but was more educated than the general population in China (see Appendix 2 in Supplemental Materials found at https://doi.org/10.1016/j.jval.2025.04.2151). Overall, 24.6% indicated having a chronic disease, of which the 2 most commonly reported were hypertension (9.8%) and gastrointestinal disease (7.8%).

Distributional Characteristics

Ceiling for EQ-HWB items ranged from 12.1% (sleep) to 81.5% (personal care), whereas floor ranged from 0.1% (discomfort [severity]) to 4.3% (anxiety) (Table 1). Notably, for the 3 items that were changed from positively framed to negatively framed, the distribution was similar to the other items, with ceiling and floor percentages as follows: enjoyable activities (66.0% and 1.2%), excluded by others (49.6% and 1.5%), and negative feelings about oneself (30.5% and 2.6%). Four EQ-HWB items showed ceiling effect (day-to-day activities, getting around inside or outside, personal care, and hearing), and none demonstrated a floor effect. The ceiling for the EQ-5D-5L items ranged from

Table 1. Distribution of responses for the outcome measures.

Measures	Responses, *n* (%)				
EQ-HWB	**No difficulty**	**Slight difficulty**	**Moderate difficulty**	**A lot of difficulty**	**Unable**
Day-to-day activities*	802 (76.2)	159 (15.1)	52 (4.9)	34 (3.2)	6 (0.6)
Enjoyable activities	695 (66.0)	249 (23.6)	74 (7.0)	22 (2.1)	13 (1.2)
Getting around inside or outside*	846 (80.3)	124 (11.8)	40 (3.8)	37 (3.5)	6.0 (0.6)
Personal care	858 (81.5)	117 (11.1)	41 (3.9)	28 (2.7)	9.0 (0.9)
Seeing	494 (46.9)	377 (35.8)	114 (10.8)	51 (4.8)	17 (1.6)
Hearing	800 (76.0)	151 (14.3)	52 (4.9)	33 (3.1)	17 (1.6)

	None of the time	**A little of the time**	**Sometimes**	**Often**	**Most or all the time**
Sleep	127 (12.1)	392 (37.2)	356 (33.8)	146 (13.9)	32 (3.0)
Exhaustion*	209 (19.8)	351 (33.3)	333 (31.6)	123 (11.7)	37 (3.5)
Loneliness*	351 (33.3)	318 (30.2)	234 (22.2)	116 (11)	34 (3.2)
Unsupported	332 (31.5)	363 (34.5)	240 (22.8)	86 (8.2)	32 (3.0)
Memory	212 (20.1)	356 (33.8)	326 (31.0)	139 (13.2)	20 (1.9)
Cognition*	238 (22.6)	370 (35.1)	301 (28.6)	113 (10.7)	31 (2.9)
Anxiety*	281 (26.7)	333 (31.6)	260 (24.7)	134 (12.7)	45 (4.3)
Unsafe	490 (46.5)	305 (29.0)	160 (15.2)	74 (7.0)	24 (2.3)
Frustration	307 (29.2)	373 (35.4)	264 (25.1)	88 (8.4)	21 (2.0)
Sadness or depression*	344 (32.7)	368 (34.9)	214 (20.3)	93 (8.8)	34 (3.2)
Hopeless	470 (44.6)	293 (27.8)	188 (17.9)	76 (7.2)	26 (2.5)
Lacked control over daily life*	361 (34.3)	362 (34.4)	194 (18.4)	104 (9.9)	32 (3.0)
Coping	454 (43.1)	355 (33.7)	172 (16.3)	58 (5.5)	14 (1.3)
Excluded by others	522 (49.6)	297 (28.2)	152 (14.4)	66 (6.3)	16 (1.5)
Negative feelings about self	321 (30.5)	388 (36.8)	215 (20.4)	102 (9.7)	27 (2.6)
Pain (frequency)	329 (31.2)	359 (34.1)	258 (24.5)	78 (7.4)	29 (2.8)

	No	**Mild**	**Moderate**	**Severe**	**Very severe**
Pain (severity)*	397 (37.7)	573 (54.4)	74 (7)	6 (0.6)	3 (0.3)

	None of the time	**A little of the time**	**Sometimes**	**Often**	**Most or all the time**
Discomfort (frequency)	308 (29.2)	440 (41.8)	232 (22.0)	67 (6.4)	6 (0.6)

	No	**Mild**	**Moderate**	**Severe**	**Very severe**
Discomfort (severity)	346 (32.9)	620 (58.9)	82 (7.8)	4 (0.4)	1 (0.1)

EQ-5D-5L	**No problems**	**Slight problems**	**Moderate problems**	**Severe problems**	**Extreme problems/ unable**
Mobility	903 (85.7)	122 (11.6)	24 (2.3)	3 (0.3)	1 (0.1)
Self-care	944 (89.6)	83 (7.9)	23 (2.2)	2 (0.2)	1 (0.1)
Usual activities	857 (81.4)	166 (15.7)	24 (2.3)	6 (0.6)	0 (0.0)

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Table 1. Continued

EQ-5D-5L	No problems	Slight problems	Moderate problems	Severe problems	Extreme problems/ unable
Pain/discomfort	361 (34.3)	615 (58.4)	66 (6.2)	10 (1.0)	1 (0.1)
Anxiety/depression	444 (42.2)	465 (44.1)	117 (11.1)	22 (2.1)	5 (0.5)

SWEMSWB	All of the time	Often	Some of the time	Rarely	None of the time
Being optimistic	165 (15.7)	514 (48.8)	254 (24.1)	100 (9.5)	20 (1.9)
Being useful	264 (25.1)	410 (38.9)	295 (28.0)	75 (7.1)	9 (0.8)
Being relaxed	126 (12.0)	395 (37.5)	337 (32.0)	160 (15.2)	35 (3.3)
Dealing problems well	173 (16.4)	468 (44.4)	333 (31.6)	71 (6.7)	8 (0.8)
Thinking clearly	225 (21.4)	513 (48.7)	259 (24.6)	49 (4.7)	7 (0.6)
Being close to people	262 (24.9)	360 (34.2)	304 (28.8)	106 (10.1)	21 (2.0)
Made own decision	217 (20.6)	508 (48.2)	262 (24.9)	57 (5.4)	9 (0.8)

SF-6Dv2	Not at all	Limited in vigorous activities	Limited in moderate activities	Limited in moderate a lot	Limited in bathing and dressing
Physical functioning	378 (35.9)	491 (46.6)	152 (14.4)	29 (2.7)	3 (0.3)

	None of the time	A little of the time	Some of the time	Most of the time		All of the time
Role limitation	245 (23.3)	500 (47.4)	282 (26.8)	23 (2.2)		3 (0.3)
Social functioning	374 (35.5)	421 (40.0)	207 (19.6)	45 (4.3)		6 (0.6)
Mental health	259 (24.6)	476 (45.2)	273 (25.9)	41 (3.9)		4 (0.4)
Vitality	146 (13.9)	408 (38.7)	384 (36.5)	95 (9.0)		20 (1.9)
	No	Very mild	Mild	Moderate	Severe	Very severe
Pain	331 (31.4)	422 (40.0)	241 (22.9)	52 (5.0)	5 (0.5)	2 (0.2)

WHO-5	All of the time	Most of the time	More than half the time	Less than half the time	Some of the time	At no time
Cheerful in good spirits	94 (8.9)	583 (55.4)	203 (19.3)	105 (10.0)	56 (5.3)	12 (1.1)
Calm and relaxed	124 (11.8)	513 (48.7)	246 (23.4)	103 (9.8)	60 (5.7)	7 (0.6)
Active and vigorous	115 (10.9)	432 (41.0)	271 (25.7)	145 (13.8)	67 (6.4)	23 (2.2)
Fresh and rested	140 (13.3)	436 (41.4)	255 (24.2)	125 (11.9)	77 (7.3)	20 (1.9)
Filled with interested things	107 (10.2)	368 (34.9)	294 (27.9)	143 (13.6)	120 (11.4)	21 (2.0)

ICECAP-A	All/a lot/ completely	Many/ quite a lot	A few/a little	Cannot/ unable to
Stability	374 (32.9)	578 (54.9)	119 (11.3)	9 (0.9)
Attachment	344 (32.6)	531 (50.4)	168 (15.9)	10 (0.1)
Autonomy	391 (37.1)	537 (51.0)	116 (11.0)	9 (0.9)
Achievement	249 (23.6)	450 (42.7)	331 (31.4)	23 (2.3)
Enjoyment	446 (42.3)	481 (45.7)	124 (11.8)	2 (0.2)

*EQ-HWB-S items.

34.3% (anxiety/depression) to 89.6% (self-care), with 3 items (mobility, self-care, and usual activities) showing a ceiling effect, and no items showing a floor effect. In contrast, no SF-6Dv2, SWEMWBS, ICECAP-A, or WHO-5 items showed ceiling or floor effects.

The means for the EQ-HWB and EQ-HWB-S LSSs were 80.7 and 80.0, respectively (Table 2). Respondents reported higher mean EQ-HWB and EQ-HWB-S LSSs than both the mean EQ VAS (77.6) and WHO-5 overall score (67.1) on a scale of 0 to 100. The mean SF-6Dv2 Chinese index value was 0.76, whereas the mean EQ-5D-5L Chinese and UK index values were substantially higher at 0.88. Appendix 3 in Supplemental Materials found at https://doi.org/10.1016/j.jval.2025.04.2151 illustrates the index value/overall score distribution across all measures.

Convergent Validity

The results of correlation analysis between EQ-HWB and other measures' items are shown in Table 3 and Appendices 4 and 5 in Supplemental Materials found at https://doi.org/10.1016/j.jval.2025.04.2151. Overall, the strength of correlation between the EQ-HWB items and EQ-5D-5L and SF-6Dv2 items was stronger than between the EQ-HWB items and ICECAP-A, SWEMWBS, and WHO-5 items. In line with our hypotheses, strong correlations were found among most conceptually overlapping pairs, with the strongest correlations being present for the pain items. The EQ-HWB "getting around inside or outside" showed moderate correlation with EQ-5D-5L mobility (rho = 0.34) and weak with SF-6Dv2 physical functioning (rho = 0.31). EQ-HWB "day-to-day activities" and "enjoyable activities" exhibited moderate correlation with EQ-5D-5L "usual activities" (rho = 0.36 and 0.33). For ICECAP-A, the strongest correlation was found between the EQ-HWB items "anxiety" (rho = 0.43) and "negative feelings about oneself" (rho = 0.42) with ICECAP-A "stability." For SWEMWBS, the strongest correlation was observed between "hopeless" and "anxiety" of EQ-HWB with "being optimistic" of SWEMWBS (rho = 0.47 and 0.46). All 5 items of the WHO-5 showed a moderate-to-strong correlation with the "sadness or depression" item of the EQ-HWB (range of rho: 0.45-0.54). Among the 3 items that were changed to negatively framed in the modified EQ-HWB, only "negative feelings about oneself" showed any strong correlations with items from other instruments: EQ-5D-5L anxiety/depression (0.53), SF-6Dv2 mental health (0.55), and WHO-5 cheerful in good spirits (0.50).

Both EQ-HWB and EQ-HWB-S LSSs showed strong correlations with all outcome measures, with correlation coefficients ranging from 0.53 (EQ VAS) to 0.72 (SF-6Dv2 CN index value) (Table 4). WHO-5 total scores and ICECAP-A and SWEMWBS index values were more strongly correlated with each other (range of r = 0.68-0.77) than with the EQ-HWB (r = 0.57-0.61) or EQ-HWB-S (r = 0.58-0.63).

Known-Group Validity

Among the 9 known groups, the EQ-HWB LSS differentiated between 5 groups (perceived SES, chronic disease, diabetes, ophthalmopathy, and gastrointestinal disease), whereas the EQ-HWB-S LSS differentiated between 3 groups (diabetes, ophthalmopathy, and gastrointestinal disease), both with a large ES (Table 5). The EQ-HWB LSS showed a larger ES than the EQ-HWB-S LSS for all known groups. The EQ-5D-5L, EQ VAS, SF-6Dv2, ICECAP-A, SWEMWBS, and WHO-5 were able to differentiate between 5, 6, 7, 1, 2, and 2 known groups with large effect sizes, respectively.

Compared with other instruments, the EQ-HWB showed the largest effect size for self-perceived SES (large) and for education (small). For the 6 disease groups, as expected, EQ-5D-5L, SF-6Dv2 index values, and EQ VAS showed larger effect sizes than the pure well-being measures (ICECAP-A, WHO-5, and SWEMWBS), whereas EQ-HWB and EQ-HWB-S typically fell in the middle.

Structural Validity

The Kaiser-Meyer-Olkin (0.97) and Bartlett's ($P < .001$) tests confirmed the adequacy of the data for conducting PCA. The results showed a 4-component model (Table 6). All items loaded on at least 1 component, explaining 55% of the total variance. Note that for items loading on 2 factors, we report them below based on their highest factor loading.

1. Psychological health and well-being (EQ-HWB: sleep, exhaustion, loneliness, unsupported, memory, cognition, anxiety, unsafe, frustration, sadness or depression, hopeless, lacked control over daily life, coping, excluded by others, and negative feelings about oneself; EQ-5D-5L: anxiety/depression)
2. Daily activities and sensory functioning (EQ-HWB: day-to-day activities, enjoyable activities, getting around inside or outside, personal care, seeing, and hearing; EQ-5D-5L: mobility, self-care, and usual activities)

Table 2. Descriptive characteristics of the scores and index values on the outcome measures.

Measures	Mean	Standard deviation	Median	Observed range	Floor (%)	Ceiling (%)
EQ-HWB LSS	80.7	12.7	82	38-100	0	2.6
EQ-HWB-S LSS	80.0	13.6	82	31-100	0	5.2
EQ-5D-5L index value (UK crosswalk)	0.88	0.12	0.88	−0.15 to 1	0	21.8
EQ-5D-5L index value (China)	0.88	0.13	0.89	−0.21 to 1	0	21.8
EQ VAS	77.6	16.5	81	0-100	0.1	2.5
SF-6Dv2 index value (UK)	0.80	0.15	0.82	−0.32 to 1	0	7.2
SF-6Dv2 index value (China)	0.76	0.14	0.76	0.08-1	0	7.2
ICECAP-A index value (UK)	0.83	0.15	0.85	0.07-1	0	11.6
SWEMWBS index value (UK)	0.80	0.18	0.84	−0.09 to 1.008	0	0.09
WHO-5 overall score	67.1	19.7	72	0-100	0.5	2.4

Note. High scores indicate better health or well-being for all instruments. LSS indicates level sum score.

Table 3. Convergent validity of EQ-HWB with EQ-5D-5L and SF-6D.

EQ-HWB	EQ-5D-5L					SF-6Dv2					
	MO	SC	UA	PD	AD	PF	RL	SF	PA	MH	VT
Day-to-day activities*	0.31	0.29	0.36	0.21	0.30	0.24	0.30	0.31	0.30	0.27	0.23
Enjoyable activities	0.27	0.31	0.33	0.24	0.28	0.21	0.30	0.31	0.30	0.28	0.23
Getting around inside or outside*	0.34	0.39	0.33	0.15	0.17	0.31	0.25	0.27	0.25	0.19	0.12
Personal care	0.28	0.39	0.30	0.16	0.22	0.16	0.26	0.29	0.24	0.19	0.12
Seeing	0.24	0.24	0.28	0.32	0.29	0.24	0.29	0.28	0.34	0.28	0.25
Hearing	0.32	0.37	0.35	0.17	0.19	0.18	0.25	0.27	0.25	0.17	0.12
Sleep	0.24	0.21	0.28	0.42	0.43	0.30	0.42	0.41	0.43	0.45	0.46
Exhaustion*	0.19	0.14	0.23	0.40	0.47	0.27	0.43	0.39	0.45	0.52	0.57
Loneliness*	0.24	0.27	0.31	0.32	0.52	0.25	0.43	0.42	0.38	0.51	0.42
Unsupported	0.24	0.21	0.27	0.32	0.47	0.24	0.41	0.43	0.37	0.49	0.43
Memory	0.25	0.25	0.29	0.43	0.39	0.34	0.45	0.44	0.45	0.42	0.42
Cognition*	0.20	0.14	0.26	0.37	0.44	0.28	0.42	0.41	0.41	0.43	0.42
Anxiety*	0.23	0.23	0.28	0.34	0.60	0.25	0.48	0.43	0.39	0.60	0.51
Unsafe	0.28	0.28	0.31	0.29	0.42	0.27	0.44	0.43	0.37	0.44	0.38
Frustration	0.21	0.23	0.30	0.30	0.58	0.22	0.45	0.47	0.37	0.60	0.49
Sadness or depression*	0.20	0.18	0.28	0.34	0.55	0.25	0.44	0.46	0.38	0.58	0.46
Hopeless	0.26	0.19	0.27	0.30	0.48	0.22	0.41	0.42	0.34	0.49	0.40
Lacked control over daily life*	0.20	0.22	0.28	0.33	0.46	0.25	0.44	0.43	0.37	0.48	0.42
Coping	0.29	0.29	0.34	0.30	0.45	0.24	0.42	0.45	0.35	0.45	0.39
Excluded by others	0.25	0.28	0.27	0.22	0.40	0.19	0.40	0.44	0.31	0.42	0.31
Negative feelings about oneself	0.26	0.21	0.29	0.32	0.53	0.25	0.43	0.44	0.39	0.55	0.45
Pain (frequency)	0.28	0.26	0.30	0.60	0.36	0.34	0.45	0.45	0.64	0.38	0.39
Pain (severity)*	0.28	0.23	0.32	0.73	0.37	0.32	0.43	0.44	0.72	0.38	0.43
Discomfort (frequency)	0.37	0.34	0.39	0.55	0.47	0.36	0.52	0.50	0.58	0.49	0.46
Discomfort (severity)	0.29	0.25	0.33	0.70	0.43	0.33	0.50	0.48	0.68	0.46	0.45

Colour	Cutoff	Correlation strength
	≥0.50	Strong
	≤0.49	Moderate
	≤0.29	Weak

AD indicates anxiety/depression; MH, mental health; MO, mobility; PA, pain; PD, pain/discomfort; PF, physical functioning; RL, role limitation; SC, self-care; SF, social functioning; UA, usual activities; VT, vitality.
*EQ-HWB-S items.

3. Pain/discomfort and limitations in functioning due to it (EQ-HWB: pain [frequency], pain [severity], discomfort [frequency], discomfort [severity]; EQ-5D-5L: pain/discomfort; SF-6Dv2: physical functioning, role limitation, social functioning, pain, and vitality)
4. Positive well-being (all items from SWEMWBS, ICECAP-A and WHO-5, and SF-6Dv2: mental health). Six EQ-HWB items loaded on both the first and fourth factors, with higher factor loadings on the first factor in all cases.

Considering the highest factor loading per item, the 2 of the 3 EQ-HWB items that were revised to be negatively framed in the modified questionnaire loaded on the "psychological health and well-being" factor (negative feelings about oneself and excluded by others), whereas "enjoyable activities" loaded on the "daily activities and sensory functioning" factor.

Discussion

To our knowledge, this is the first study to assess the psychometric properties of the modified EQ-HWB and EQ-HWB-S and compare its performance with 5 HRQoL and well-being-related instruments, including 4 preference-accompanied measures. Overall, the modified EQ-HWB and EQ-HWB-S demonstrated satisfactory psychometric performance in a Chinese general population sample, including distributional characteristics and

Table 4. Convergent validity between index values and level summary scores.

Measurement	Pearson's correlation coefficient (95% confidence interval)								
	EQ VAS	WHO-5 total score	EQ-HWB-S level sum score	EQ-5D-5L index value (UK crosswalk)	EQ-5D-5L index value (China)	SF-6Dv2 index value (UK)	SF-6Dv2 index value (China)	ICECAP-A index value (UK)	SWEMWBS index value (UK)
EQ-HWB level sum score	0.56 (0.52, 0.60)	0.61 (0.58,0.65)	0.96 (0.95,0.97)	0.66 (0.62,0.71)	0.64 (0.61,0.68)	0.70 (0.67,0.73)	0.72 (0.69,0.75)	0.57 (0.53,0.61)	0.60 (0.56,0.64)
WHO-5 total score	0.55 (0.51, 0.59)	-	-	-	-	-	-	-	-
EQ-HWB-S level sum score	0.53 (0.48, 0.57)	0.63 (0.59,0.67)	-	-	-	-	-	-	-
EQ-5D-5L index value (UK crosswalk)	0.52 (0.58,0.57)	0.55 (0.51,0.59)	0.62 (0.58,0.66)	-	-	-	-	-	-
EQ-5D-5L index value (China)	0.51 (0.47,0.55)	0.49 (0.44,0.53)	0.60 (0.56,0.64)	0.97 (0.95,0.97)	-	-	-	-	-
SF-6Dv2 index value (UK)	0.56 (0.52,0.60)	0.66 (0.62,0.69)	0.69 (0.66,0.72)	0.76 (0.75,0.80)	0.73 (0.71,0.76)	-	-	-	-
SF-6Dv2 index value (China)	0.57 (0.53,0.61)	0.66 (0.62,0.68)	0.70 (0.67,0.73)	0.74 (0.74,0.79)	0.72 (0.68,0.74)	0.94 (0.93,0.94)	-	-	-
ICECAP-A index value (UK)	0.51 (0.57,0.56)	0.77 (0.74,0.79)	0.58 (0.54,0.62)	0.52 (0.47,0.56)	0.49 (0.44,0.53)	0.64 (0.60,0.67)	0.61 (0.57,0.65)	-	-
SWEMWBS index value (UK)	0.50 (0.45,0.54)	0.73 (0.70,0.75)	0.60 (0.57,0.64)	0.46 (0.41,0.50)	0.44 (0.40,0.49)	0.57 (0.52,0.61)	0.53 (0.48,0.57)	0.68 (0.65,0.71)	-

convergent validity with conceptually overlapping items from EQ-5D and SF-6Dv2.

We believe that it is worthwhile to compare the results, where relevant, to those of previous psychometric analyses. In a previous study conducted in a mixed Chinese population of patients, carers, and the general public with the original EQ-HWB,[9] the same 4 items (day-to-day activities, getting around inside or outside, personal care, and hearing) showed ceiling effects, similar to that in our study; along with "safety" and "coping." In comparison with other populations that used the original EQ-HWB,[7,9] the distribution of responses on the 3 items revised from positively framed to negatively framed differed substantially. For these 3 items (enjoyable activities, feeling excluded by others, and negative feelings about oneself), the floor with the modified wording decreased to 1.2% to 2.6%, compared with 17% to 25% observed with the positively worded versions in a previous study among the Australian general public.[7] Meanwhile, the ceiling increased slightly from 11% to 18% in Australia (for the positively framed items) to 31% to 66% for the negatively framed versions in this study. Given our sample's higher education levels and younger age compared with previous EQ-HWB studies, these findings should be interpreted with caution. The results may reflect fewer health and well-being issues because of the participants' characteristics.

Modified EQ-HWB items showed moderate-to-strong correlations with overlapping items from other instruments, although these correlations were lower than those reported in previous studies with the original instrument.[2,7-10] A surprising finding is that the correlation between EQ-HWB "getting around inside or outside" and EQ-5D-5L "mobility" was not strong. In several previous studies, including 1 from China, the original "getting around inside and outside" item showed a strong correlation with the "mobility" of the EQ-5D-5L.[2,7-9] On one hand, similar to the interpretation of the ceiling effect, limited variability in responses to some items (eg, getting around inside or outside) due to the relatively healthy population could contribute to these results. On the other hand, it is unclear how respondents perceive and interpret the "or" conjunction compared with the previous use of "and," and whether replacing "some difficulty" with "moderate difficulty" may have contributed to this as well. Moreover, we assume that moving the "how much difficulty" phrasing from the item itself to the stem may also have affected these findings. We also consider this likely, given the similarly weak correlations found between the EQ-HWB personal care and day-to-day activities items and their respective EQ-5D-5L item pairs. Future studies should consider exploring the impact of 2 key revisions separately: moving "how much difficulty" to the stem and revising "and" to "or," allowing for a clearer understanding of how these revisions affect the performance of the items.

An interesting finding is that the EQ-HWB and EQ-HWB-S showed a slightly stronger association with the SF-6Dv2 than with the EQ-5D-5L. This is reasonable because the EQ-5D-5L's content covers mostly physical aspects of health, whereas the SF-6Dv2 includes dimensions, such as social functioning and vitality, which align more closely with the content of the EQ-HWB. Additionally, considering recall periods, both the EQ-HWB (7 days) and SF-6Dv2 (4 weeks) capture experiences over longer time frames than the EQ-5D-5L, which focuses on "today." Based on the item-level correlations between items measuring similar constructs (eg, EQ-HWB anxiety, EQ-5D-5L anxiety/depression, and SF-6Dv2 mental health), the strength of the associations was similar. However, it is difficult to disentangle the role of different wording and recall period in the differences in responses and resulting associations because there may be synergistic or antagonistic effects at the item level between item content and the recall period, which add up at the instrument level. Future studies are recommended to explore the role of recall period in the differences in what these instruments measure, for example, by testing them with various recall periods.

The PCA also suggested that these instruments capture different dimensions because all items load predominantly on separate factors from any EQ-HWB items. This is consistent with some previous studies.[38,39] The most likely reason for the PCA results could be that the EQ-HWB lacks items that explicitly address positive aspects of well-being, such as meaning in life, life satisfaction, and positive relationships that often appear in other well-being instruments. The EQ-HWB, however, was designed for a different purpose, primarily for use by patients, carers, and social

Table 5. Known-group validity of the outcome measures.

Characteristics	*N*	Mean (SD)									
		EQ-HWB LSS	EQ-HWB-S LSS	EQ-5D-5L UK	EQ-5D-5L CN	SF-6Dv2 UK	SF-6Dv2 CN	ICECAP-A UK	SWEMWBS UK	WHO-5	EQ VAS
Education											
Secondary or below	270	78.4 (12.6)	77.8 (13.0)	0.86 (0.12)	0.87 (0.13)	0.78 (0.15)	0.73 (0.14)	0.80 (0.16)	0.77 (0.19)	64.2 (20.0)	72.7 (18.3)
Tertiary	783	81.5 (20.3)	80.5 (13.7)	0.88 (0.12)	0.89 (0.13)	0.81 (0.15)	0.77 (0.14)	0.84 (0.15)	0.81 (0.17)	68.1 (19.2)	79.3 (15.5)
P value		<.001	.003	.04	.030	.001	<.001	.003	.004	.008	<.001
Effect size		0.26	0.20	0.14	0.16	0.23	0.24	0.21	0.21	0.20	0.21
Perceived SES											
Lower than average	130	71.6 (13.6)	70.0 (14.5)	0.82 (0.19)	0.83 (0.17)	0.71 (0.21)	0.69 (0.17)	0.70 (0.22)	0.63 (0.25)	49.5 (24.5)	66.9 (21.3)
Equal to average	591	80.7 (12.4)	79.8 (13.2)	0.88 (0.13)	0.89 (0.12)	0.80 (0.13)	0.76 (0.14)	0.83 (0.14)	0.80 (0.16)	66.9 (18.4)	77.2 (15.0)
Higher than average	332	84.1 (11.3)	83.7 (11.8)	0.89 (0.14)	0.90 (0.13)	0.84 (0.13)	0.80 (0.13)	0.88 (0.11)	0.86 (0.13)	74.2 (21)	82.7 (14.5)
P value		<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
Effect size		0.15	0.09	0.03	0.03	0.07	0.06	0.13	0.15	0.14	0.08
Chronic disease											
Yes	259	74.7 (12.4)	74.0 (13.4)	0.82 (0.13)	0.82 (0.15)	0.72 (0.17)	0.67 (0.14)	0.77 (0.17)	0.75 (0.20)	58.5 (20.8)	67.8 (16.1)
No	794	82.6 (12.3)	81.7 (13.1)	0.90 (0.11)	0.91 (0.11)	0.83 (0.13)	0.79 (0.13)	0.85 (0.14)	0.82 (0.17)	69.8 (18.5)	80.9 (15.3)
P value		<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
Effect size		0.84	0.58	0.71	0.69	0.80	0.91	0.52	0.39	0.59	0.64
Hypertension											
No	794	82.6 (12.3)	81.7 (13.1)	0.90 (0.11)	0.91 (0.12)	0.83 (0.14)	0.79 (0.14)	0.85 (0.15)	0.82 (0.18)	69.8 (18.5)	80.8 (15.3)
Yes	103	75.8 (12.4)	75.7 (12.9)	0.80 (0.16)	0.81 (0.18)	0.73 (0.17)	0.68 (0.14)	0.79 (0.17)	0.76 (0.19)	61.5 (21.1)	68.5 (16.1)
P value		<.001	<.001	<.001	<.001	<.001	<.001	.002	.003	<.001	<.001
Effect size		0.55	0.46	0.68	0.79	0.75	0.88	0.39	0.34	0.44	0.81
High Cholesterol											
No	794	82.6 (12.3)	81.7 (13.1)	0.90 (0.11)	0.91 (0.12)	0.83 (0.14)	0.79 (0.14)	0.85 (0.15)	0.82 (0.18)	69.8 (18.5)	80.8 (15.3)
Yes	60	75.2 (13.1)	75.3 (13.7)	0.81 (0.16)	0.81 (0.16)	0.71 (0.18)	0.67 (0.15)	0.77 (0.17)	0.73 (0.19)	59.1 (22.3)	68.2 (16.3)
P value		<.001	<.001	<.001	<.001	<.001	<.001	.002	<.001	<.001	.008
Effect size		0.60	0.49	0.78	0.78	0.93	0.98	0.51	0.53	0.57	0.83
Diabetes											
No	794	82.6 (12.3)	81.7 (13.1)	0.90 (0.11)	0.91 (0.12)	0.83 (0.14)	0.79 (0.14)	0.85 (0.15)	0.82 (0.18)	69.8 (18.5)	80.8 (15.3)
Yes	47	71.9 (13.5)	70.7 (14.6)	0.77 (0.21)	0.77 (0.22)	0.69 (0.23)	0.63 (0.17)	0.77 (0.19)	0.72 (0.20)	59.5 (22.4)	66.0 (17.2)
P value		<.001	<.001	<.001	<.001	<.001	<.001	.007	.003	.003	<.001
Effect size		0.87	0.83	1.11	1.06	1.06	1.22	0.56	0.56	0.55	0.96
Arthritis											
No	794	82.6 (12.3)	81.7 (13.1)	0.90 (0.11)	0.91 (0.12)	0.83 (0.14)	0.79 (0.14)	0.85 (0.15)	0.82 (0.18)	69.8 (18.5)	80.8 (15.3)
Yes	63	72.9 (11.7)	72.5 (13.1)	0.77 (0.17)	0.78 (0.19)	0.70 (0.19)	0.66 (0.15)	0.76 (0.18)	0.74 (0.22)	56.7 (21.7)	67.3 (16.7)
P value		<.001	<.001	<.001	<.001	<.001	<.001	<.001	.005	<.001	<.001
Effect size		0.79	0.71	1.09	1.06	0.97	1.03	0.61	0.46	0.70	0.88
Ophthalmopathy											
No	794	82.6 (12.3)	81.7 (13.1)	0.90 (0.11)	0.91 (0.12)	0.83 (0.14)	0.79 (0.14)	0.85 (0.15)	0.82 (0.18)	69.8 (18.5)	80.8 (15.3)
Yes	37	69.2 (11.5)	69.9 (13.1)	0.75 (0.16)	0.75 (0.17)	0.65 (0.19)	0.62 (0.16)	0.69 (0.2)	0.68 (0.21)	51.3 (21.5)	64.8 (18.5)
P value		<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
Effect size		1.09	0.90	1.37	1.33	1.34	1.33	1.10	0.83	0.98	1.04
Gastrointestinal disease											
No	794	82.6 (12.3)	81.7 (13.1)	0.90 (0.11)	0.91 (0.12)	0.83 (0.14)	0.79 (0.14)	0.85 (0.15)	0.82 (0.18)	69.8 (18.5)	80.8 (15.3)
Yes	82	71.6 (12.9)	71.1 (13.6)	0.78 (0.14)	0.79 (0.16)	0.69 (0.16)	0.65 (0.14)	0.76 (0.16)	0.74 (0.22)	56.3 (20.0)	65.3 (17.2)
P value		<.001	<.001	<.001	<.001	<.001	<.001	<.001	.004	<.001	<.001
Effect size		0.89	0.80	1.01	0.99	1.04	1.11	0.58	0.42	0.72	1.01

Colour	Coefficient range		Correlation strength
	Cohen's d	Eta^2	
	≥0.8	≥0.14	Large
	0.5-0.79	0.06-0.13	Medium
	0.2-0.49	0.01-0.05	Small

Note. Effect size for 2-group comparison is Cohen's D; for 3-group comparison is Eta.^{2}

care users, which explains why different aspects of well-being are emphasized. Furthermore, the EQ-HWB is a hybrid questionnaire designed to measure both health and well-being, whereas other typical well-being instruments used in our study focus solely on well-being. It is notable that the EQ-HWB items constituting factor 1, from "sleep" to "negative feelings about oneself," are presented in the same matrix-format table within the questionnaire, combining psychosocial health and well-being items using the same response scale. Both of these aspects may be reflected in the PCA results.

This study has several limitations. First, our sample came from online panel and was not representative of the Chinese general population, particularly in terms of the distribution of educational levels. Second, the study design did not include parallel testing (eg,

Table 6. Principal component analysis.

Measures	Items	Psychosocial health and well-being	Daily activities and sensory functioning	Pain and discomfort and limitations in functioning due to it	Positive well-being
EQ-HWB	Day-to-day activities*		0.67		
	Enjoyable activities		0.58		
	Getting around inside or outside*		0.72		
	Personal care		0.72		
	Seeing		0.49		
	Hearing		0.72		
	Sleep	0.49			
	Exhaustion*	0.61			
	Loneliness*	0.60			
	Unsupported	0.59			
	Memory	0.50			
	Cognition*	0.62			
	Anxiety*	0.63			0.41
	Unsafe	0.58			
	Frustration	0.64			0.40
	Sadness or depression*	0.64			0.43
	Hopeless	0.54			0.44
	Lacked control over daily life*	0.61			0.31
	Coping	0.53	0.41		
	Excluded by others	0.55			
	Negative feelings about oneself	0.59			0.41
	Pain (frequency)	0.44		0.58	
	Pain (severity)*			0.78	
	Discomfort (frequency)	0.40		0.57	
	Discomfort (severity)			0.74	
EQ-5D-5L	Mobility		0.59	0.41	
	Self-care		0.68		
	Usual activities		0.56	0.43	
	Pain/discomfort			0.81	
	Anxiety/depression	0.50			0.40
SWEMWBS	Being optimistic				0.71
	Being useful				0.60
	Being relaxed				0.66
	Dealing problems well				0.59
	Thinking clearly				0.54
	Being close to people				0.62
	Made own decision				0.53
ICECAP-A	Stability				0.66
	Attachment				0.67
	Autonomy				0.69
	Achievement				0.61
	Enjoyment				0.48
SF-6Dv2	Physical functioning			0.42	
	Role limitation			0.52	
	Social functioning			0.49	
	Pain			0.79	
	Mental health	0.46			0.52
	Vitality			0.46	0.45
WHO-5	Cheerful in good spirits				0.77
	Calm and relaxed				0.70
	Active and vigorous				0.70
	Fresh and rested				0.65
	Filled with interested things				0.75

*Items of EQ-HWB-S.

completion of both versions or a crossover design) of the original and modified EQ-HWB, limiting our ability to directly assess the impact of these modifications. The fixed order of outcome measures within the survey also represents a limitation due to potential order effects. Lastly, our study's cross-sectional nature limited our ability to examine the EQ-HWB's responsiveness to changes over time or its test-retest reliability—both important aspects of HRQoL and well-being measures' performance.

Conclusions

Our findings present mixed evidence regarding the psychometric properties of the modified EQ-HWB and EQ-HWB-S. Although certain modifications, such as reduced floor for previously positively phrased items, suggest improvements in distributional properties compared with earlier studies in China and other countries, other aspects exhibited challenges. Notably, item-level correlations were weaker than those reported in prior research. These findings provide preliminary evidence and contribute to the growing evidence pool from ongoing data collection with the modified EQ-HWB, which will inform decisions regarding the finalization of the descriptive system.

Author Disclosures

Author disclosure forms can be accessed below in the Supplemental Material section.

Supplemental Material

Supplementary data associated with this article can be found in the online version at https://doi.org/10.1016/j.jval.2025.04.2151.

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