

Content-Related Validity of the RAND-36 Composite Scores with Other Patient-Reported Outcome Scales Among National Health and Wellness Survey Respondents in the United States, Japan, and 5 European Countries

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Introduction

- The RAND-36 is a publicly available version of the 36-Item Short Form Health Survey (SF-36). It is a set of quality-of-life measures.¹
- Few studies evaluate the content-related validity of the RAND-36 across regions.

Objective

To evaluate the association between the RAND-36 measure of health-related quality of life and other validated patient-reported outcome scales (PROs).

Methods

Data Source:

- The National Health and Wellness Survey (NHWS) is a web-based self-reported panel survey collected across multiple geographies. The survey is nationally representative per each geography.
- The data used in this study was collected in 2023 for the United States (US) and Japan (JP); the data used for the five European countries (5EU), including Germany, Spain, France, Italy, and the United Kingdom, was collected in 2022.

Participants:

- Eligibility**
- NHWS respondents in all regions must provide informed consent and are required to be 18 years of age or older.
- In the US, respondents must provide information on race and if they are of Hispanic, Latino, or Spanish origin.
- Each region's cohort consisted of all eligible NHWS respondents.

Measures:

- Key Patient-Reported Outcomes (PROs)
- RAND-36: global health composite score (GHC)¹
- RAND-36: mental health composite score (MHC)¹
- RAND-36: physical health composite score (PHC)¹
- EQ5D index & EQ VAS²
- Work Productivity and Activity Impairment (WPAI)³
- Absenteeism, presenteeism, and overall work impairment are only evaluated in employed respondents.
- Patient Health Questionnaire-9 (PHQ-9)⁴
- Generalized Anxiety Disorder-7 (GAD-7)⁵
- Migraine Disability Assessment (MIDAS)⁶
 - Evaluated in respondents who reported experiencing migraine or migraine headaches in the past twelve months.

- Insomnia Severity Index (ISI)⁷
 - Evaluated in respondents who reported experiencing insomnia, idiopathic hypersomnia, narcolepsy, sleep apnea, or other sleep difficulties in the past twelve months.
- Dermatology Life Quality Index (DLQI)⁸
 - Evaluated in respondents who have ever experienced alopecia areata, chronic hives, psoriasis, rosacea, or vitiligo OR respondents who have experienced atopic dermatitis, dermatitis, eczema, hidradenitis suppurativa, or shingles in the past twelve months.

Statistical Analyses:

- Descriptive statistics were used to describe respondent characteristics.
- Pearson's correlations were used to describe the association between the RAND-36 measures and the other listed PROs.

Results

Sample Characteristics

- 75,007 respondents completed the US 2023 NHWS, 30,013 completed the Japan 2023 NHWS, and 62,005 completed the 5EU 2022 NHWS. The mean respondent ages were similar between the US, Japan, and 5EU. Mean ages were 47.9 (SD=17.9), 52.6 (SD=17.0), and 49.6 (SD=16.9) respectively [Table 1].
- Half were females in all regions, 57%, 58%, and 60% were married or living with a partner in the US, Japan, and 5EU, and 51%, 56%, and 44% had university education respectively. 47% in the US, 38% in Japan, and 35% in 5EU reported having above average/median annual household income, and 61%, 59%, and 56% were employed respectively.

Table 1. Respondent Characteristics

Numeric - Mean (Standard Deviation) Categorical - N (Column %)		US 2023	Japan 2023	5EU 2022
		N=75,007	N=30,013	N=62,005
Characteristics (numeric)	Age (years)	47.9 (17.9)	52.6 (17.0)	49.6 (16.9)
	Number of adults living in household	2.1 (0.9)	2.3 (1.0)	2.1 (1.1)
	Number of children living in household	0.6 (1.0)	0.3 (0.7)	0.5 (0.9)
	Body Mass Index (BMI, kg/m²)	27.6 (7.2)	22.3 (4.1)	26.0 (6.0)
	Female	39,913 (53%)	14,614 (49%)	32,420 (52%)
Characteristics (categorical)	Married / living with partner	42,581 (57%)	17,195 (58%)	37,231 (60%)
	University education	38,085 (51%)	16,828 (56%)	27,307 (44%)
	Above average/median annual household income*	35,300 (47%)	11,321 (38%)	21,949 (35%)
	Employed	45,440 (61%)	17,517 (59%)	34,833 (56%)
	Overweight/obese (BMI ≥ 25 kg/m²)	42,361 (57%)	5,342 (18%)	29,333 (47%)
	Any exercise (past month)	52,844 (71%)	13,527 (45%)	38,943 (63%)
	Any tobacco use	35,937 (48%)	11,983 (40%)	37,493 (61%)
	Any alcohol use	51,285 (68%)	17,934 (60%)	45,194 (73%)

*DE ≥ €50K; ES ≥ €30K; FR ≥ €30K; IT ≥ €30K; JP ≥ ¥5M; UK ≥ £30K; US ≥ \$75K

Scale correlations - Japan

Table 3. Pearson correlations for RAND-36 composite scores by validated scales among respondents in Japan

	N	Global Health Composite	Mental Health Composite	Physical Health Composite
EQ-5D Index Score ¹	30,013	.67	.57	.69
EQ-VAS Score ¹	30,013	.65	.61	.56
Absenteeism ³	15,866	-.32	-.26	-.34
Presenteeism ³	16,355	-.59	-.54	-.54
Overall Work Impairment ³	15,720	-.60	-.54	-.55
Overall Activity Impairment ³	30,013	-.66	-.59	-.63
PHQ-9 Score ⁴	30,013	-.62	-.65	-.43
PHQ-9 Category ⁴	30,013	-.59	-.62	-.41
GAD-7 Score ⁵	30,013	-.62	-.62	-.41
GAD-7 Category ⁵	30,013	-.58	-.62	-.38
MIDAS Score ⁶	5,579	-.33	-.29	-.32
MIDAS Category ⁶	5,579	-.31	-.27	-.31
ISI Score ⁷	2,818	-.41	-.43	-.27
ISI Category ⁷	2,818	-.44	-.46	-.30
DLQI Score ⁸	6,778	-.39	-.38	-.32
DLQI Category ⁸	6,778	-.38	-.36	-.33

All correlations are significant with p<.001; *A higher score indicates a better quality of life OR a less severe condition; †A higher score indicates a worse quality of life OR a more severe condition

Scale correlations - US

For each region, the EQ-5D index, EQ-VAS, overall work impairment, and overall activity impairment were highly correlated with each composite score (|rp|>.50). PHQ-9 and GAD-7 scores were highly correlated with the RAND-36 GHC and MHC in all regions. MIDAS, ISI, and DLQI scores were moderately correlated (|rp|>.30) with the GHC for all regions. All correlations between the RAND-36 composite scores and the other PROs were statistically significant (all p<.001) [Tables 2-4].

Table 2. Pearson correlations for RAND-36 composite scores by validated scales among respondents in the US

	N	Global Health Composite	Mental Health Composite	Physical Health Composite
EQ-5D Index Score ¹	75,007	.69	.60	.66
EQ-VAS Score ¹	75,007	.63	.54	.61
Absenteeism ³	40,251	-.45	-.37	-.48
Presenteeism ³	39,785	-.70	-.61	-.68
Overall Work Impairment ³	39,721	-.70	-.62	-.69
Overall Activity Impairment ³	75,007	-.74	-.63	-.73
PHQ-9 Score ⁴	75,007	-.67	-.70	-.48
PHQ-9 Category ⁴	75,007	-.64	-.67	-.46
GAD-7 Score ⁵	75,007	-.65	-.70	-.45
GAD-7 Category ⁵	75,007	-.61	-.66	-.41
MIDAS Score ⁶	16,790	-.36	-.31	-.34
MIDAS Category ⁶	16,790	-.41	-.37	-.36
ISI Score ⁷	32,097	-.53	-.54	-.39
ISI Category ⁷	32,097	-.50	-.50	-.37
DLQI Score ⁸	18,128	-.43	-.38	-.42
DLQI Category ⁸	18,128	-.46	-.42	-.43

All correlations are significant with p<.001; †A higher score indicates a better quality of life OR a less severe condition; ‡A higher score indicates a worse quality of life OR a more severe condition

Scale correlations – 5 EU

Table 4. Pearson correlations for RAND-36 composite scores by validated scales among NHWS respondents in 5EU

	N	Global Health Composite	Mental Health Composite	Physical Health Composite
EQ-5D Index Score ¹	62,005	.66	.56	.68
EQ-VAS Score ¹	62,005	.58	.51	.56
Absenteeism ³	30,556	-.44	-.37	-.46
Presenteeism ³	29,441	-.67	-.59	-.64
Overall Work Impairment ³	29,277	-.67	-.60	-.66
Overall Activity Impairment ³	62,005	-.74	-.65	-.72
PHQ-9 Score ⁴	62,005	-.64	-.67	-.47
PHQ-9 Category ⁴	62,005	-.61	-.64	-.45
GAD-7 Score ⁵	62,005	-.62	-.67	-.43
GAD-7 Category ⁵	62,005	-.58	-.63	-.40
MIDAS Score ⁶	13,634	-.35	-.34	-.35
MIDAS Category ⁶	13,634	-.33	-.30	-.31
ISI Score ⁷	24,237	-.44	-.44	-.34
ISI Category ⁷	24,237	-.48	-.48	-.37
DLQI Score ⁸	14,818	-.36	-.31	-.36
DLQI Category ⁸	14,818	-.34	-.29	-.35

All correlations are significant with p<.001; †A higher score indicates a better quality of life OR a less severe condition; ‡A higher score indicates a worse quality of life OR a more severe condition

Conclusions

- The three RAND-36 composite scores were comparable to other validated PROs.
- The strong correlations between the scales of interested confirmed the content validity of the RAND-36 scale as a representative measure of HRQoL.
- The results confirmed the practical use of RAND-36 as a measure of HRQoL in the US, Japan, and 5EU NHWS data.

References

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