

Health-related quality-of-life (HRQoL) assessment for Japanese cognitive impairment associated with schizophrenia (CIAS)

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Objectives

Health-related quality-of-life (HRQoL) in Japanese patients with cognitive impairment associated with schizophrenia (CIAS) has not been previously investigated. This study aims to evaluate HRQoL in Japanese CIAS patients using the Health Utilities Index Mark 3 (HUI3) and the EuroQol 5-dimension 5- level (EQ-5D-5L), a general preference-based measure.

MSR177

Introduction

- EuroQol 5-Dimension 5-Level (EQ-5D-5L) is a widely used generic health-related quality-of-life (HRQoL) measure. EQ-5D-5L is also the most frequently used health utility measure for calculating quality-adjusted life years in health economic analyses¹. However, previous studies have suggested that the EQ-5D-5L demonstrates lower validity and responsiveness in mental health contexts, including schizophrenia². In contrast, other widely used generic HRQoL measures, such as the Health Utilities Index Mark 3 (HUI3), have shown superior psychometric performance².
- The HUI3 covers a broader range of dimensions, including cognition and emotional health, and can better reflect the HRQoL of patients with mental health problems. However, despite its long-standing use, a version of the HUI3 based on Japanese preferences was only developed in 2020³. Consequently, there is a lack of studies assessing the psychometric properties of the HUI3 in Japan.
- Furthermore, no studies have addressed the appropriateness of the HUI3 in assessing the Japanese population with schizophrenia, particularly those with cognitive impairment associated with schizophrenia (CIAS). CIAS occurs in most patients with schizophrenia and predicts poor functional outcomes⁴⁻⁵. Evaluating the HUI3 for Japanese patients with CIAS is essential in selecting a more appropriate instrument to assess their HRQoL.

Methods

- This study utilized blinded baseline data from the Japanese subgroup in the Phase III randomized, placebo-controlled trials CONNEX-1 and CONNEX-2. These trials investigate the efficacy, safety, and tolerability of iclepertin in adult patients with schizophrenia who are currently stable on antipsychotic treatment. Baseline scores prior to study drug administration were used to calculate descriptive statistics for each HRQoL measure, including multi- and single-attribute utility scores of the Japanese HUI3 and the EQ-5D-5L index score^{6,7}). Each score was calculated using the Japanese tariff.
- The HUI3 includes eight HRQoL attributes: vision, hearing, speech, ambulation, dexterity, emotion, cognition, and pain, each with five or six levels. The HUI3 single-attribute utility scores (0-1) for each dimension are derived from 12 questions. These scores are then transformed into a multi-attribute utility score⁴.
- Exploratory factor analysis will be performed to explore the structure of the relationship between levels of each dimension of the EQ-5D-5L and the single-attribute utilities of HUI3. The number of factors were determined by the Kaiser criterion (based on eigen values > 1) and scree plot. Factor loadings will be estimated after orthogonal varimax and oblique promax rotations, respectively.

Patient characteristics

- A cohort of 167 Japanese adults with schizophrenia, with a mean age of 37.4 years, were enrolled in the study.

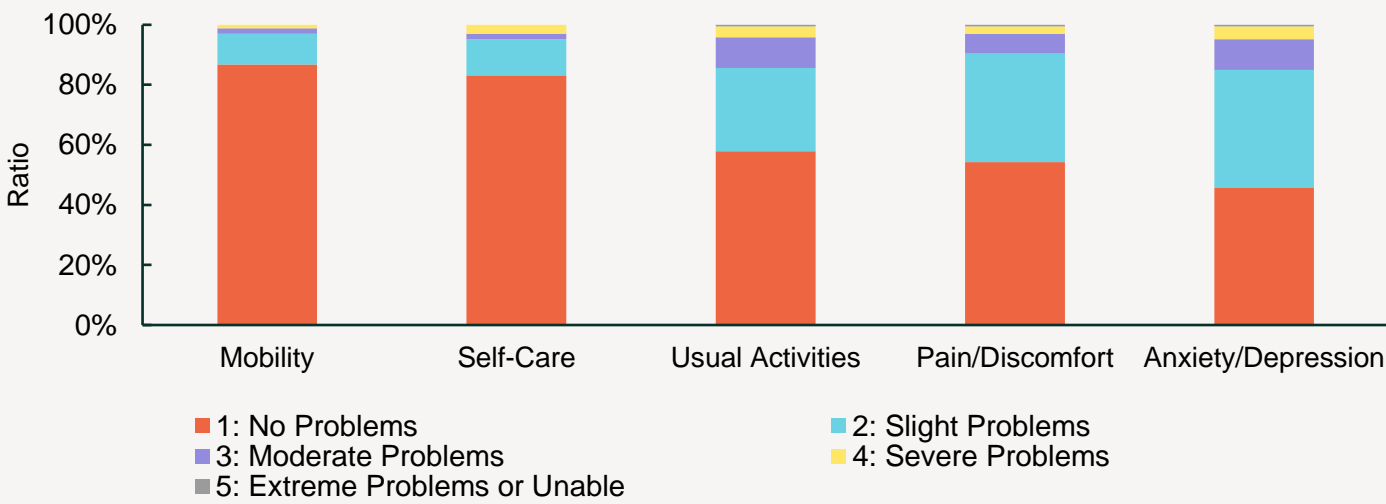
Age	Mean (SD)	Median (IQR)	1Q, 3Q	Min, Max
	37.4 (8.9)	38 (15)	31, 46	19, 50
Gender	Male		Female	
	82 (49.1%)		85 (50.9%)	

Descriptive statistics

- The median (25th, 75th percentile) HUI3 multi-attribute utility score was 0.63 (0.42, 0.82), while the EQ-5D-5L index score was 0.85 (0.77, 0.89). Among the HUI3 single-attribute utility scores, the cognition score was the lowest at 0.58 (0.58, 0.83), followed by the speech score at 1.00 (0.56, 1.00)

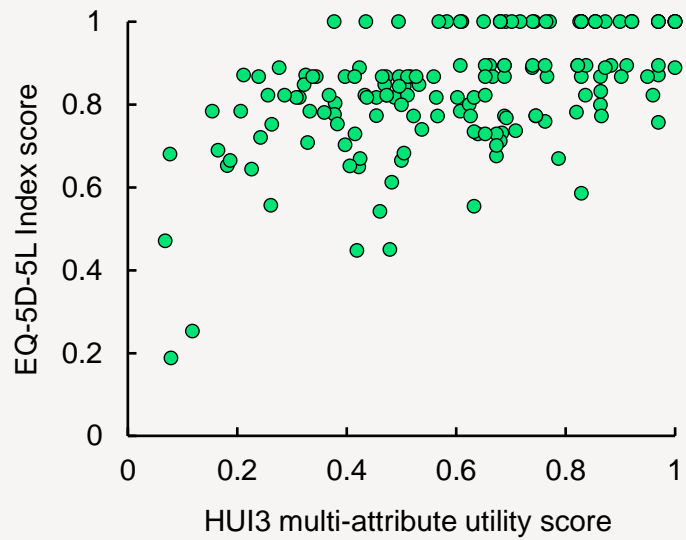
HUI3		Mean (SD)	Median (IQR)	1Q, 3Q	Min, Max
Multi-attribute utility score		0.60 (0.24)	0.63 (0.40)	0.42, 0.82	0.07, 1.00
Single-attribute utility scores	Vision	0.94 (0.11)	0.96 (0.04)	0.96, 1.00	0.31, 1.00
	Hearing	0.93 (0.21)	1.00 (0.00)	1.00, 1.00	0.00, 1.00
	Speech	0.83 (0.23)	1.00 (0.44)	0.56, 1.00	0.00, 1.00
	Ambulation	0.99 (0.07)	1.00 (0.00)	1.00, 1.00	0.16, 1.00
	Dexterity	1.00 (0.03)	1.00 (0.00)	1.00, 1.00	0.73, 1.00
	Emotion	0.86 (0.21)	0.91 (0.00)	0.91, 0.91	0.00, 1.00
	Cognition	0.64 (0.26)	0.58 (0.25)	0.58, 0.83	0.00, 1.00
	Pain	0.91 (0.14)	0.92 (0.08)	0.92, 1.00	0.00, 1.00

EQ-5D-5L		Mean (SD)	Median (IQR)	1Q, 3Q	Min, Max
Index score		0.83 (0.14)	0.85 (0.13)	0.77, 0.89	0.19, 1.00



Relationship between results

- The figure presents a scatterplot between the HUI3 multi-attribute utility scores and the EQ-5D-5L index utility scores.
- There was a strong ceiling effect for the EQ-5D-5L index utility scores, whereas the HUI3 multi-attribute utility scores exhibited a smaller ceiling effect.



Exploratory Factor Analysis

- A 4-factor structure was identified after performing varimax rotation and extracting factors with an eigenvalue of >1. According to this structure, the components of EQ-5D-5L and HUI3 were categorized into the following groups:
 - Mental and Daily Functioning (Factor 1)
 - Mobility (Factor 2)
 - Discomfort (Factor 3)
 - Communication (Factor 4)
- Among the four factors, Factor 1 (Mental and Daily Functioning) is strongly associated with cognitive and mental health problems. Additionally, the HUI3 covers HRQoL related to Communication (Factor 4). Interestingly, the “Pain” attribute in the HUI3 and the “Pain/Discomfort” dimension in the EQ-5D-5L exhibited different responses. The “Pain” attribute in the HUI3 contains impairment in social activities resulting from pain, while the “Pain/Discomfort” dimension in the EQ-5D-5L reflects HRQoL related to the severity of the pain itself.

Measure	Variable	Factor loadings				Unique ness
		Factor 1	Factor 2	Factor 3	Factor 4	
HUI3	Vision	-0.18	-0.03	-0.14	0.27	0.91
	Hearing	0.40	0.06	0.34	0.18	0.77
	Speech	0.11	-0.13	-0.01	0.66	0.45
	Ambulation	-0.02	-0.80	-0.02	0.07	0.32
	Dexterity	-0.15	0.14	-0.09	0.51	0.77
	Emotion	0.53	0.15	-0.05	0.05	0.70
	Cognition	0.70	-0.06	0.12	0.09	0.50
EQ-5D-5L	Pain	0.60	0.20	-0.30	-0.03	0.46
	Mobility	-0.07	0.50	0.24	0.01	0.60
	Self-care	-0.49	0.32	0.03	0.04	0.59
	Usual activities	-0.54	0.25	0.12	0.05	0.53
	Pain / Discomfort	-0.07	0.07	0.80	-0.05	0.27
	Anxiety / Depression	-0.61	0.01	0.15	-0.05	0.51

Factor loadings of ≥0.40 was denoted in red.

Discussion

- Among the patients with schizophrenia currently stable with antipsychotic treatment, the multi-attribute utility of HUI3 tended to be lower than the index utility of EQ-5D-5L. In particular, cognition and speech-attribute utilities were markedly lower than other attribute utilities.
- Compared to the EQ-5D-5L index utility, the HUI3 multi-attribute utility showed lower ceiling effects, implying it is more sensitive to the study population (patients with schizophrenia).
- Exploratory factor analysis indicated that the HUI3 covers HRQoL related to communication, as well as mental and daily functioning aspects. HUI3 may be more suitable if the disease or symptom affects communication.

Conclusions

HRQoL scores of Japanese patients with CIAS are being assessed for the first time. HUI3 could contribute to the appropriate assessment of HRQoL scores in Japanese patients with CIAS, as some domains of HUI3 are able to capture the effects of cognitive function.

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Abbreviations

HRQoL, Health-related quality-of-life; CIAS, Cognitive impairment associated with schizophrenia; HUI3, Health Utilities Index Mark 3; EQ-5D-5L, EuroQol 5-Dimension 5-Level; SD, Standard deviation; IQR, Inter-quartile range; 1Q, 25 percentile; 3Q, 75 percentile; Min, Minimum; Max, Maximum

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