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Validation of the Schizophrenia Quality of Life Scale Revision 4 among Chronic Schizophrenia Patients in Malaysia

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ABSTRACT

Objectives: To explore the validity and reliability of a disease-specific health-related quality-of-life questionnaire—the Schizophrenia Quality of Life Scale Revision 4 (SQLS-R4)—in patients with schizophrenia in Malaysia. **Methods:** A total of 222 outpatients with schizophrenia receiving treatment at the Universiti Kebangsaan Malaysia Medical Centre completed the SQLS-R4 in either the Malay or the English language. A generic self-report health-related quality-of-life measure—the EuroQoL group EuroQol five-dimensional questionnaire—and a measure of symptom severity—the Clinical Global Impression-Schizophrenia scale—were also administered to assess validity. **Results:** Good internal consistency reliability was found for both the psychosocial and vitality domains (Cronbach's $\alpha = 0.95$ and 0.85 , respectively). Most items were also significantly correlated with their own scale score (r_s ranging from 0.29 to 0.74). There was a moderate correlation between the SQLS-R4 “vitality” domain and the EuroQol five-dimensional ques-

tionnaire “usual activities” domain ($r_s = 0.44$) and a large correlation between the SQLS-R4 “psychosocial” domain and the EuroQol five-dimensional questionnaire “anxiety/depression” domain ($r_s = 0.44$ – 0.57). Most of the symptom dimensions of the Clinical Global Impression-Schizophrenia scale were also moderately correlated with the SQLS-R4 subscale scores. **Conclusions:** The SQLS-R4 is a valid and reliable health-related quality-of-life instrument for use in minimally ill patients with schizophrenia in Malaysia, but some of the items may be redundant and irrelevant. Validation of SQLS-R4 in different types of patients and various levels of illness severity is required to further verify its application.

Keywords: health-related quality of life, reliability, schizophrenia, validity.

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Introduction

For the past two decades, health-related quality of life (HRQOL) has increasingly become an important outcome measure in clinical trials, health services research, patient management, and resource allocation [1]. Similarly, the development of new antipsychotic medications has resulted in HRQOL being an essential measure of treatment success in schizophrenia [2]. Internationally defined as the patient's self-reported health and ability to function physically, mentally, and socially, HRQOL described an array of life dimensions affected by disease and treatment interventions [3]. Thus, it is a significant outcome in schizophrenia, a debilitating psychiatric disorder that causes profound disruptions in many areas of patients' life functioning [4].

Many instruments have been developed to measure HRQOL, but there is no consensus on the most appropriate scale for measuring HRQOL in schizophrenia [5]. The instrument of choice for HRQOL measurement depends on the assessment purposes [6]. Generic instruments designed to be applicable across all diseases or conditions are likely to be useful in comparing different groups of

patients, while disease-specific measures have more potential in detecting treatment effects [7]. Schizophrenia-specific questionnaires such as the Heinrichs-Carpenter Quality of Life Scale, the Drug Attitude Inventory, and the Subjective Well-being under Neuroleptics have been used to evaluate the effectiveness of antipsychotic medications on HRQOL. The predominantly used scale is the Heinrichs-Carpenter Quality of Life Scale [7]. Although the Heinrichs-Carpenter Quality of Life Scale has historical values, it is an observer-rated instrument primarily designed to address negative symptoms in schizophrenia [6].

One of the essential features of a schizophrenia-specific HRQOL instrument includes incorporation of life domains highly relevant to individuals with schizophrenia [8]. One such measure is the Schizophrenia Quality of Life Scale by Wilkinson et al. [9], a brief self-report scale that has been translated into 52 languages including the Malay language through standardized procedures and validated in several East Asian countries such as Japan, Korea, and Taiwan [10–12]. Currently available in its most recent revised form, the Schizophrenia Quality of Life Scale Revision 4 (SQLS-R4) comprises items that concern those

Conflicts of interest: The authors have indicated that they have no conflicts of interest with regard to the content of this article.

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Published by Elsevier Inc.

doi:10.1016/j.vhri.2012.03.006

suffering from schizophrenia and is thus of potential use in clinical trials and evaluation of clinical interventions such as drug treatments [10].

Patients with schizophrenia in Malaysia have been living in the community since community-based psychiatric services were established in numerous hospitals [13]. Although several studies have been conducted to examine their life qualities, none has reported the use of the SQLS-R4. The effect of antipsychotics in patients with schizophrenia is substantial because of not only their potential to alleviate symptoms but also the impact of side effects on patients' functioning and well-being [14]. Partly designed to assess the effect of antipsychotic medications on HRQOL, the SQLS-R4 has prior evidence of excellent psychometric properties [15], thus rendering it a potential tool for determining HRQOL among patients with schizophrenia in Malaysia, primarily managed by pharmacological treatment. The objective of this study therefore was to evaluate the validity and reliability of the SQLS-R4 as an outcome measure of HRQOL among patients with schizophrenia in Malaysia.

Methods

Subjects

A convenience sample of 222 outpatients with schizophrenia attending the Psychiatry Clinic at Universiti Kebangsaan Malaysia Medical Centre was enrolled in the study. Inclusion criteria for subject selection were 1) a diagnosis of schizophrenia according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, American Psychiatric Association 1994, 2) age between 18 and 65 years, 3) clinically stable (not acutely ill or has not been recently hospitalized at least for the past 3 months), 4) has fair understanding of the illness, 5) understands Malay or English language, and 6) provided consent to participate in the study. Patients who were pregnant or those who had an associated diagnosis of mental retardation, organic brain diseases, or substance abuse were excluded.

Measure

The SQLS-R4 was developed by Wilkinson et al. [9] for the measurement of HRQOL in people with schizophrenia. It comprises 33 items incorporated in two domains: psychosocial feelings (22 items) and cognition and vitality (11 items). All except four items are scored on a five-point Likert-type scale (0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = always), with the exceptional four items being reverse coded (0 = always, 1 = often, 2 = sometimes, 3 = rarely, 4 = never). Individual domain and total scores are standardized by scoring algorithm to a 0 to 100 scale, with higher scores indicating comparatively lower quality of life. Its factor structure and internal reliability have been verified in schizophrenic patients in the Netherlands and further replicated in a group of patients with schizophrenia in the United Kingdom and Taiwan [12,15].

The EuroQol Group EuroQol five-dimensional (EQ-5D) questionnaire is a simple generic instrument that generates a health profile and preference-based index scores of HRQOL [16]. The first part is a descriptive system (EQ-5D self-classifier) that facilitates individuals to categorize their health condition in five dimensions, mobility, self-care, usual activities, pain/discomfort, and anxiety/depression, with each dimension divided into three levels of severity ranging from 1 (no problem) to 3 (many problems). The second section consists of a vertical visual analogue scale (VAS), with end points of 0 and 100 indicating "worst" and "best" imaginable health state, respectively. The third section is the EQ-index, which represents a series of societal preferential values for the full set of 243 health states, with

the states of perfect health and death usually being assigned values of 1 and 0, respectively. Only the EQ-5D self-classifier and the EQ-VAS were used for the present study.

The Clinical Global Impression-Schizophrenia (CGI-SCH) scale is a simple and brief scale adapted from the Clinical Global Impression scale that has a widespread application in rating the overall severity of any mental disorder [17]. The CGI-SCH scale specifically measures the severity of illness and degree of change in schizophrenia in four symptom dimensions, positive, negative, depressive, and cognitive, as well as overall severity rated on a seven-point scale ranging from 1 (no illness) to 7 (most severe possible) [18]. For the purpose of the present study, only the CGI-SCH Severity of Illness scale was used.

Procedure

Patients' case notes were screened to identify eligible subjects for the study. Patients who fulfilled all the inclusion criteria were invited to participate and given an explanation about the study. Patients who provided written informed consent were then asked to complete the self-administered SQLS-R4, the EQ-5D self classifier, and EQ-VAS, which were available in two languages: the Malay language and the English version for Malaysia. Demographic and clinical data were compiled by case-note review and patients' interviews. Patients' clinical status was assessed via the CGI-SCH Severity of Illness scale by the attending clinician. The research protocol of the study was approved by the Medical Research and Ethics Committee of the Universiti Kebangsaan Malaysia Medical Centre.

Statistical analysis

Patient characteristics were presented by using descriptive statistics. The internal consistency of the SQLS-R4 was determined by item to total correlations and Cronbach's alpha coefficients. It was hypothesized that the EQ-5D "anxiety/depression" domain would be addressing issues related to those of the SQLS-R4 "psychosocial" domain and the "cognition/vitality" domain would be associated with the "usual activities" domain. Correlations of items with their scale totals of at least 0.40 and a value of Cronbach's alpha between 0.70 and 0.90 are highly suggested for a robust scale [19]. The construct validity and clinical validity was established by comparing scores of the SQLS-R4 subscales with those of the EQ-5D self-classifier and the CGI-SCH scale, respectively, by means of Spearman's rank correlations. Correlation was considered large for $|r_s| \geq 0.5$, moderate for $0.3 \leq |r_s| \leq 0.5$, and small for $0.1 \leq |r_s| \leq 0.3$ [20]. For all analyses, the level of statistical significance was defined as alpha less than 0.05. The statistical analyses were performed by using the Statistical Package for the Social Sciences, version 16.0 (SPSS, Inc., Chicago, IL).

Results

Of the 222 subjects, 192 (86.5%) completed the SQLS-R4 in Malay and 30 (13.5%) completed the SQLS-R4 in English. The subjects comprised nearly equal number of men and women with minimal symptoms severity. The ethnic group composition of the study subjects was reflective of a Malaysian population, with the majority of the patients being Malay followed by Chinese and Indian. Most other background characteristics of the subjects were also comparable with those of schizophrenic outpatients found in other catchment area in Malaysia [13,21]. Table 1 shows the demographic characteristics of the subjects. The baseline scores of SQLS-R4 subscales and the distribution of the scores are shown in Table 2. A broad range of scores was observed for both the psychosocial and vitality subscales. For both the subscales, floor effects (the percentage of patients acquiring the lowest score) and ceiling

Table 1 – Characteristics of study subjects (n = 222).

Variables	
Age (y), mean ± SD	37.73 ± 10.13
Sex, n (%)	
Men	110 (49.5)
Women	112 (50.5)
Ethnicity, n (%)	
Malay	117 (52.7)
Chinese	78 (35.1)
Indian	26 (11.7)
Others	1 (0.5)
Marital status, n (%)	
Single	154 (69.4)
Married	68 (30.6)
Education background, n (%)	
Primary	15 (6.8)
Secondary	157 (70.7)
Tertiary	50 (22.5)
Living arrangement, n (%)	
Family	207 (93.2)
Independent	15 (6.8)
Employment status, n (%)	
Employed	113 (50.9)
Unemployed	109 (49.1)
Age at onset (y), mean ± SD	26.24 (7.78)
Duration of illness (y), mean ± SD	11.42 ± 8.02
CGI-SCH scale score*	
Median (IQR)	
Overall symptoms	2.0 (2.0)
Positive symptoms	1.0 (1.0)
Negative symptoms	2.0 (1.0)
Depressives symptoms	1.0 (1.0)
Cognitive symptoms	1.5 (1.0)
IQR, interquartile range.	
* Clinical Global Impression-Schizophrenia Severity of Illness scale rated on a seven-point scale with 1 = normal and 7 = extremely ill.	

effects (the proportion of patients achieving the highest score) were minimal.

Correlations of items with their respective subscale (corrected to omit the item being correlated) and Cronbach's alpha coefficients of each subscale were computed to determine the internal

Table 2 – Distribution of SQLS-R4 subscale scores.

	Scale	
	Psychosocial	Vitality
n	220	221
Mean	31.22	36.00
SD	21.23	18.23
Median	30.00	36.54
Range of scores*	0–93.75	0–82.69
% scoring minimum	3.6	0.9
% scoring maximum	0	0
25th percentile	12.50	23.08
50th percentile	30.00	36.54
75th percentile	46.25	48.08
SQLS-R4, Schizophrenia Quality of Life Scale Revision 4.		
* Score of each scale ranges from 0 (best possible health) to 100 (worst possible health).		

Table 3 – Correlation coefficients of corrected items to total scores and internal reliability of SQLS-R4 subscales (Cronbach's alpha).

Scale and items	Item to total correlation	Cronbach's alpha
Psychosocial		
Item 3 (Worry about future)	0.62	0.95
Item 4 (Feel lonely)	0.62	
Item 5 (Feel hopeless)	0.65	
Item 6 (Feel panicky)	0.62	
Item 8 (Take things people say the wrong way)	0.57	
Item 10 (Difficult to mix with people)	0.67	
Item 11 (Feel down)	0.70	
Item 13 (Feel very mixed up)	0.70	
Item 15 (Feelings go up and down)	0.72	
Item 16 (Concerned won't get better)	0.67	
Item 17 (Worry about things)	0.74	
Item 18 (Feel people avoid me)	0.67	
Item 19 (Get upset thinking about the past)	0.70	
Item 21 (Feel cut off from the world)	0.72	
Item 22 (Feel uncomfortable with people)	0.70	
Item 24 (Has upsetting thoughts)	0.69	
Item 25 (Has suicidal thoughts)	0.51	
Item 27 (Feel depressed)	0.62	
Item 29 (Feel restless)	0.70	
Item 30 (Concerned about social life)	0.68	
Cognition and vitality		
Item 1 (Lack energy to do things)	0.57	0.85
Item 2 (Can't be bothered to do things)	0.52	
Item 7 (Able to carry out daily activities)	0.34	
Item 9 (Find hard to concentrate)	0.64	
Item 12 (Feel I can cope)	0.40	
Item 14 (Sleep well)	0.29	
Item 20 (Trouble remembering things)	0.56	
Item 23 (Has trouble thinking clearly)	0.55	
Item 26 (Feel happy)	0.47	
Item 28 (Feel drowsy)	0.45	
Item 31 (Feel tired)	0.62	
Item 32 (Feel physically weak)	0.70	
Item 33 (Feel like not leading a normal life)	0.58	
Note. For all correlations, $P < 0.01$. SQLS-R4, Schizophrenia Quality of Life Scale Revision 4.		

consistency of the psychosocial and vitality subscales of the SQLS-R4 (Table 3). For most items, corrected item to total correlations were satisfactory, ranging from 0.51 to 0.74 in the psychosocial domain and 0.45 to 0.70 in the vitality domain, above the 0.40 criterion for item-internal consistency. Nonetheless, three items from the vitality subscale had correlations less than or equal to 0.40—item 7: able to carry out daily activities ($r_s = 0.34$), item 12:

Table 4 – Correlations between the SQLS-R4, the EQ-5D questionnaire, and the CGI-SCH scale.

	SQLS-R4	
	Psychosocial	Vitality
EQ-5D questionnaire		
Mobility	0.07	0.17*
Self-care	0.12	0.09
Usual activities	0.31 [†]	0.44 [†]
Pain/discomfort	0.32 [†]	0.42 [†]
Anxiety/depression	0.57 [†]	0.51 [†]
VAS	−0.37 [†]	−0.43 [†]
CGI-SCH Scale		
Overall symptoms	0.33 [†]	0.44 [†]
Positive symptoms	0.39 [†]	0.38 [†]
Negative symptoms	0.19 [†]	0.27 [†]
Depressive symptoms	0.37 [†]	0.36 [†]
Cognitive symptoms	0.37 [†]	0.39 [†]

Note. Higher scores on the SQLS-R4 indicate worst condition, while higher scores on the EQ-VAS indicate a better condition.

CGI-SCH, Clinical Global Impression-Schizophrenia Severity of Illness scale; EQ-5D questionnaire, EuroQoL five-dimensional questionnaire; SQLS-R4, Schizophrenia Quality of Life Scale Revision 4; VAS, visual analogue scale.

* $P < 0.05$ by Spearman's rank correlation.

[†] $P < 0.01$.

feel I can cope ($r_s = 0.40$), and item 14: sleep well ($r_s = 0.29$). The Cronbach's alpha values for psychosocial and vitality subscales were 0.95 and 0.85, respectively, beyond the 0.70 standard for acceptable instrument internal reliability. The deletion of any of the 33 items also did not improve the Cronbach's alpha values for both domains.

Construct validity of the SQLS-R4 scale was explored by measuring its associations with the EQ-5D questionnaire and the CGI-SCH scale (Table 4). Correlations between the SQLS-R4 subscales and domains of the EQ-5D questionnaire ranged from 0.07 to 0.57. The SQLS-R4 "psychosocial" domain score was significantly correlated with most of the EQ-5D questionnaire domains except the "mobility" and "self-care" domain scores. As anticipated, a large correlation was found between the SQLS-R4 "psychosocial" dimension score and the EQ-5D questionnaire "anxiety/depression" domain score ($r_s = 0.57$). The SQLS-R4 "vitality" dimension scores had moderate correlations with the EQ-5D questionnaire "usual activities" ($r_s = 0.44$) and "pain/discomfort" domain scores ($r_s = 0.42$) and were also strongly correlated with the "anxiety/depression" scores ($r_s = 0.51$). Significant correlations were also found between the EQ-VAS scores and both the SQLS-R4 subscale scores ($r_s = -0.37$ and -0.43 for psychosocial and vitality domain, respectively). Most of the CGI-SCH scale symptom scores except for the negative symptom scores were also modestly correlated with subscale scores of the SQLS-R4 ($r_s = 0.33$ – 0.39 and $r_s = 0.36$ – 0.44 for psychosocial and vitality domain, respectively).

Discussion

Overall, the psychometric characteristics of the SQLS-R4 scale were good. Assessment of the internal consistency revealed significantly high correlations of items with their scale total except for three items. Similar findings were also found in the validation of the SQLS-R4 among patients with schizophrenia in Japan [10] and Taiwan [12].

As suggested by Kuo et al. [12], these results may be indicative of those items being interpreted differently from the vitality construct in the Asian customs. Alternatively, because of the

study design, the study included patients with minimal severity of symptoms and so those items with low item-total correlations may not be relevant to clinically stable patients. Patients in the Taiwan and Japan study also comprised psychologically stable patients, but sample size for both studies was relatively smaller.

The internal consistency of SQLS-R4 as reflected by Cronbach's alpha was also as high as those found in the Taiwan [12] and UK study [15]. A Cronbach's alpha of greater than 0.90 implies redundancy where several items in the psychosocial domain asked similar issues [19].

A prior study had utilized the short form 36 health survey to validate the SQLS-R4 [12]. Here, the EQ-5D questionnaire was used instead because it is a widely used and brief HRQOL measure. Moreover, it had been shown to have acceptable discriminative and construct validity in patients with schizophrenia [3]. Strong correlations between the EQ-5D questionnaire "anxiety/depression" dimension and the SQLS-R4 domains demonstrate that the EQ-5D questionnaire indeed assessed the same concepts, and state of anxiety or depression also affects patient's vitality. Alternatively, no significant correlation found between the EQ-5D questionnaire "mobility" and "self-care" domains and the SQLS-R4 "vitality" domain may be because subjects in the present study were outpatients who have minimal severity and no apparent difficulty to move or care for themselves.

The negative correlation between scores on the SQLS-R4 subscales and the EQ-VAS also confirmed the expected direction of association between the SQLS-R4 and the EQ-5D questionnaire or convergent validity of the SQLS-R4. Higher scores on the SQLS-R4 show a worse condition, whereas higher scores on the EQ-VAS indicate a better condition [12].

With the exception of negative symptoms, all the symptom scores of the CGI-SCH scale were also modestly correlated with the overall and the SQLS-R4 subscales scores. Findings regarding the correlations between psychopathology and HRQOL had been ambivalent, but negative symptoms had been commonly associated with reduced quality of life among schizophrenia patients [22]. Patients with predominantly negative symptoms who normally display characteristics of anhedonia (social withdrawal) are rather uncommunicative and are thus an obvious obstacle during recruitment into the study, resulting in them being possibly inadvertently excluded from the present study.

The present study was limited in terms of study subjects because the sample consisted mainly of clinically stable chronic patients with minimal severity of illness. Therefore, further investigation that includes different types of patients and patients with various degree of symptom severity is required to verify further the reliability of the SQLS-R4 and its application as an HRQOL outcome measure.

Conclusions

The study provides initial evidence for the validity and reliability of the SQLS-R4 in patients with schizophrenia in Malaysia. The SQLS-R4 displayed good psychometric properties and has potential use as a self-report schizophrenia-specific HRQOL instrument. However, some of the items in the scale may be redundant and inappropriate for patients with minimal severity of symptoms.

Source of financial support: The authors have no other financial relationships to disclose. The views expressed in this article are those of the authors.

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