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Life satisfaction in persons with schizophrenia living in the community

Validation of the satisfaction with life scale

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Abstract Subjective well-being is an increasingly common indicator of adequacy of psychiatric services. An easy-to-administer assessment tool of subjective well-being that is conceptually sound, valid, and reliable is needed for use in persons with schizophrenia. The purpose of this paper was to validate the 5-item Satisfaction with Life Scale (SWLS)-Taiwan version for persons with schizophrenia living in the community. Specifically, the internal consistency reliability, construct validity and criterion-related validity were examined. Data were obtained from a total of 443 patients with schizophrenia at multiple areas of Taiwan. Item analysis and confirmatory factor analysis were performed. The results revealed that the SWLS had good international consistency reliability and suggested a single-factor structure in life satisfaction among this patient group. The SWLS has good criterion-related validity with the brief World Health Organization Quality of Life Assessment (WHOQOL-BREF). It is concluded that the SWLS is a sound measurement to be used with persons with schizophrenia living in the community.

Keywords Psychometric analysis · Outcome measure · Quality of life · Subjective well-being

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1 Introduction

Subjective quality of life (QOL) is an increasingly common indicator of treatment adequacy in healthcare services. The core concern is, given certain diseases or illnesses, how to enhance individual patients' subjective perceptions about their lives with expectations, concerns, goals, and standards they impose on their lives (e.g., Frisch 1992; WHO 1993, 1995). This concern is shared in the care of people with schizophrenia who live in the community. However, how do we determine the level of quality of life perceived by persons with schizophrenia?

In the existing literature, several measurement tools have been specifically developed to assess QOL for persons with schizophrenia, such as the Quality of Life Scale (QLS, Heinrichs et al. 1984), and the Quality of Life Questionnaire in Schizophrenia (S-QoL, Auquier et al. 2003). In addition, some generic instruments also have been validated for this patient population, including the World Health Organization Quality of Life Assessment (WHOQOL) (e.g., Örsel et al. 2004), the Medical Outcome Study (MOS) 36-Item Short-Form Health Survey (SF-36) (e.g., Pukrop et al. 2003) and the EuroQoL-5 Dimensions (EQ-5D) (e.g., Prieto et al. 2003). A related review can be found in the study by Bobes et al. (2005). The common features of theses measurements of QOL constitute the assessment of respondents' positions in various life domains.

However, there have been debates related to multiple-domain measures of subjective QOL. Multiple-domain measurements share a common assumption that life domains included in the measurement are sufficient to assess one's QOL. It has been argued that QOL is personally defined by a person's expectations, concerns, goals and standards imposed on his or her life (for example, Frisch 1992; WHO 1993, 1995). Given that each person may have different structures of life domains, multiple-domain measurements may not capture the life domains that each person values and thus may not accurately assess QOL for all people.

To reflect individual differences, some authors have suggested that QOL is measured by allowing the respondent to nominate his or her valued life domains (for example, Dijkers 2003; O'Boyle 1994). Unfortunately, such a suggestion brings another drawback that comparisons across individual persons in terms of level of QOL are not allowed. To preserve the idiosyncratic content of life for each individual and fulfill the purpose of comparison across persons or populations, it has been proposed that QOL be measured globally with the whole life content. In fact, Diener and associates (1985) adopted this approach to assess individuals' satisfaction with the whole life and developed the 5-item Satisfaction with Life Scale (SWLS). The SWLS was developed to assess satisfaction with one's life as a whole, with the consideration that different people may have very different ideas about what constitutes a good life. The SWLS has been used extensively since 1985 and has good psychometric properties among people of different occupations and cultures (see Pavot and Diener 1993).

The 5-item SWLS can be completed quickly without extensive effort and is an ideal global measurement to be used with persons with schizophrenia. While the SWLS has been widely studied, unfortunately, the psychometric properties of the SWLS have not yet been examined in patients with schizophrenia. Although the SWLS was once used as a measurement of QOL for persons with schizophrenia in Hong Kong (Chan et al. 2003a, b), the psychometric properties of the SWLS for patients with schizophrenia were not considered in that study, and only a reference to a study of adolescents (Leung and Leung 1992) was cited in support of the psychometric properties of the SWLS for the Hong Kong Chinese

population. As a measurement's psychometric properties for one population may not be applicable to another, the validity and reliability of the SWLS when administered to persons with schizophrenia have yet to be examined. Therefore, the purpose of this paper was to examine the psychometric properties of the SWLS for persons with schizophrenia living in the community. Two studies are presented here. The first aimed to examine the internal consistency reliability and the factor structure of the SWLS. The second study aimed to examine the criterion-related validity of the SWLS by investigating the relationship between the SWLS and the WHOQOL-BREF (a domain measure of QOL).

2 Study 1

2.1 Method

2.1.1 Participants and procedure

Data of the SWLS were collected as part of a study carried out at multiple psychiatric institutes in Taiwan. The inclusion criteria of research participants included (a) age 18 or older, (b) a DSM-IV diagnosis of schizophrenia or schizoaffective disorder, (c) living in the community at the time of the study, and (d) ability to comprehend and provide reliable answers in a paper-and-pencil test.

Participants of the study were recruited from nine hospitals in various locations in Taiwan. After the institutional review boards of the participating hospitals had approved this study, patients who met the above inclusion criteria were invited by occupational therapists working at the hospital. Those patients who agreed to participate became participants of the study.

A total of 324 persons with schizophrenia living in the community participated in this study. The percentages of male and female participants were about equal, and the mean age was 36.3 (standard deviation (SD): 10.10). The participants were mostly single and unemployed. Detailed demographic information of the participants, as well as total scores of the SWLS of each demographic group are summarized in Table 1. The average SWLS score for the 324 respondents was 20.50 (SD: 7.33). Participants who were employed showed significantly higher SWLS scores than those who were unemployed (F (2, 306) = 4.25, $p < 0.05$; Tukey test was significant at $p < 0.05$ for employed and unemployed groups; retired group was not included in the ANOVA test because of small sample size). No other significant differences were found across different demographic characteristics (groups with small sample sizes were excluded from the ANOVA test).

2.1.2 Instrument

The Satisfaction with Life Scale (SWLS; Diener et al. 1985) is a measurement of subjective QOL. It contains five items, each accompanied by a 7-point scale ranging from 1 to 7. The higher value on the scale, the higher the degree of satisfaction on the corresponding item. The five items are (a) In most ways my life is close to my ideal, (b) The conditions of my life are excellent, (c) I am satisfied with my life, (d) So far I have gotten the important things I want in life, and (e) If I could live my life over, I would change almost nothing.

The SWLS has good reliability and validity in the general population. The internal reliability ranged from .79 to .89. The test–retest reliability coefficients were .83 for a

Table 1 Demographic data and SWLS total scores of the Study 1 participants (N = 324)

Demographic variables	Frequency (%)	SWLS total scores mean (SD)
Gender		
Male	158 (48.8%)	20.83 (7.05)
Female	156 (48.1%)	20.00 (7.45)
Missing	20 (3.1%)	
Education		
Elementary school	18 (5.6%)	21.11 (6.48)
Junior high school	68 (21.0%)	22.15 (7.46)
Senior high school	146 (45.1%)	20.09 (7.09)
College & graduate	84 (25.9%)	19.63 (7.51)
Missing	8 (2.5%)	
Marital status		
Single	248 (76.5%)	20.14 (7.37)
Married	40 (12.3%)	22.43 (6.18)
Divorced	20 (6.2%)	19.50 (7.27)
Widowed	6 (1.9%)	20.67 (7.94)
Missing	10 (3.1%)	
Employment status		
Employed	95 (29.3%)	22.22 (7.10)
Unemployed	174 (53.7%)	19.66 (7.53)
On search of jobs	40 (12.3%)	19.45 (6.22)
Retired	3 (0.9%)	23.33 (1.53)
Missing	12 (3.7%)	

2-week interval, .84 for a 1-month interval, and .64 to .82 for a two-month interval (see Pavot and Diener 1993). A single-factor was found in the SWLS (Arrindell et al. 1991, 1999; Atienza et al. 2003; Diener et al. 1985; Lewis et al. 1995; Pavot et al. 1991; Shevlin et al. 1998; Shevlin and Bunting 1994; Westaway et al. 2003). It has been found to have adequate construct, convergent, and discriminant validity (see Arrindell et al. 1999; Lucas et al. 1996; Pavot and Diener 1993). The SWLS was also validated in Hong Kong (Sachs 2003) and Taiwan (Wu and Yao 2006). The SWLS Taiwan version was used in the study.

2.1.3 Data analyses

Item analysis was conducted to examine psychometric properties of the SWLS, including mean, standard deviation, skewness, kurtosis, corrected item-total score correlations, and internal consistency reliability (Cronbach's α). Confirmatory factor analysis (CFA) was conducted to examine the single-factor structure of the SWLS, during which the five items of SWLS were presumably influenced by a general factor, the error of each item was not correlated with each other, and factor variance was set as 1. The CFA was performed by using covariance matrices in the statistical program LISREL 8.0 (Joreskog and Sorbom 1993).

For model evaluation, χ^2 tests as well as other fit indices were examined in the study. It has been reported that χ^2 tests tend to be sensitive to the sample size (Bollen 1989). A larger sample size (e.g., more than 200) may result in significant findings in χ^2 tests

(indicating a lack of fit), regardless of actual fitness. Other fit indices thus used in the study included two incremental fit indices, the Non-Normed Fit Index (NNFI) and the Comparative Fit Index (CFI), and two absolute fit indices, the root mean squared error of approximation (RMSEA) and the standardized root mean squared residual (SRMR). The general cutoffs for accepting a model for the former two indices were equal to or greater than 0.95, and equal to or less than 0.05 for the RMSEA, and less than 0.08 for the SRMR (Hu and Bentler 1999). Similar criteria for model fit evaluation were also recommended by using a cutoff value close to 0.95 for CFI in combination with a cutoff value close to 0.09 for SRMR (CFI $\geq$ 0.95; SRMR $\leq$ 0.09; Hu and Bentler 1999).

However, Hu and Bentler (1999) also mentioned that model fit evaluation based on the above criteria should not be over-generalized. Therefore, in the current study, rules proposed by them were only used for reference. In addition to overall model fit evaluation, parameter estimates were also examined to see if there is any improper solution, such as unexpected sign or extreme value. Squared multiple correlation was used to evaluate the variance accounted in the equation for each indicator (item).

2.2 Results

2.2.1 Item analysis and internal consistency reliability of the SWLS

Results of item analysis for the SWLS were provided in Table 2. Lower corrected item-total score correlations were found in items 4 and 5. A similar pattern was observed from the results of the internal consistency reliability (Cronbach's α). Deleting items 4 and 5 resulted in improvements in the internal consistency reliability of the SWLS, respectively. However, given the Cronbach's α of the whole scale was 0.84, the improvements gained were not substantial.

2.2.2 Construct validity of the SWLS

In the study, the CFA for the single-factor structure of the SWLS involved the estimation of 10 parameters with 15 data points and yielded 5 degrees of freedom. With LISREL 8.0 (Joreskog and Sorbom 1993), the maximum likelihood method was selected to estimate the parameters. The result was displayed in Table 3. The χ^2 value of this model was 9.01 (df = 5, $p > 0.05$), indicating that the model can be retained. Other fit indices indicated that this model was excellent and acceptable (NNFI = 0.99; CFI = 1.00; RMSEA = 0.05;

Table 2 Results of item analysis for the SWLS (N = 324)

	Mean	SD	Skewness	Kurtosis	Corrected item-total correlation	Cronbach's α if item deleted
Item 1	3.92	1.80	0.06	−0.87	0.73	0.79
Item 2	4.11	1.87	0.00	−0.97	0.71	0.79
Item 3	4.36	1.83	−0.14	−0.89	0.75	0.78
Item 4	4.31	1.84	−0.14	−0.91	0.60	0.82
Item 5	3.80	2.04	0.09	−1.20	0.47	0.86
Total score	20.50	7.33	0.09	−0.39	–	–

Table 3 Results of confirmatory factor analysis

	Sample in Study 1 (N = 324)		Sample in Study 2 (N = 119)	
	Unstd. estimates	Std. estimates	Unstd. estimates	Std. estimates
Factor loadings				
λ_1	1.42 (0.09)	0.79	1.68 (0.17)	0.78
λ_2	1.52 (0.09)	0.81	1.65 (0.16)	0.81
λ_3	1.56 (0.09)	0.86	1.98 (0.15)	0.95
λ_4	1.20 (0.10)	0.66	1.29 (0.18)	0.62
λ_5	1.03 (0.11)	0.50	1.01 (0.20)	0.45
Error				
δ_1	1.22 (0.13)	0.38	1.78 (0.27)	0.39
δ_2	1.19 (0.13)	0.34	1.43 (0.23)	0.35
δ_3	0.89 (0.11)	0.27	0.40 (0.19)	0.09
δ_4	1.92 (0.17)	0.57	2.70 (0.37)	0.62
δ_5	3.12 (0.26)	0.75	3.93 (0.52)	0.79

Note: All estimates were significant at $p < 0.01$. Unstd: Unstandardized estimates; Std: standardized estimates; values in parentheses were standard errors for estimates

SRMR = 0.02). There was no improper value of parameter estimates. The squared multiple correlations for the five indicators were ranged from 0.30 to 0.78, indicating the single latent factor can account for a large proportion of variance for each item.

2.2.3 Comparison to normative data in Taiwan

In order to get additional understanding of life satisfaction in persons with schizophrenia, further comparisons were made with normative data in Taiwan that were currently available. It was found that the SWLS scores of this patient group (20.50) were lower than a sample of 604 healthy participants living in Taipei metropolitan areas (mean: 22.75, SD: 6.27; Wu 2002), indicating that persons with schizophrenia may have poorer life satisfaction than the general population.

3 Study 2

The purpose of this study was to examine criterion validity of the SWLS on schizophrenia patients. The World Health Organization Quality of Life Assessment Brief version (WHOQOL-BREF) was chosen as the criterion measurement. There were two reasons to choose the WHOQOL-BREF: (1) the WHOQOL has been validated for schizophrenia patients for measuring QOL (Örsel et al. 2004), and used in previous studies for schizophrenia patients (Chan et al. 2003a, b), and (2) there is a national normative data for the WHOQOL-BREF in Taiwan (Yao et al. manuscript).

The psychometric properties of the SWLS were first cross-validated on a new sample in this study. Further, the correlation analysis between the SWLS and the WHOQOL-BREF was conducted. It was hypothesized that there was a positive relation between the SWLS and the WHOQOL-BREF. Finally, scores of the SWLS and the WHOQOL-BREF of the current sample were compared to the normative data in Taiwan.

3.1 Method

3.1.1 Participants and procedure

Data were collected during another study carried out at multiple psychiatric institutes in Taiwan. The inclusion criteria of research participants as well as procedure of data collection were the same as Study 1.

A total of 119 persons with schizophrenia living in the community participated in this study. The percentages of male and female participants were about the same, and the mean age was 36.23 (SD: 9.73). Detailed demographic information of the participants is summarized in Table 4. Scores of the SWLS and the WHOQOL-BREF of difference demographic groups are also provided in the table. The average of the SWLS score for the 119 respondents was 19.45 (SD: 8.32). The average of the four domain scores in the WHOQOL-BREF were 12.46 (SD: 2.69), 11.85 (SD: 2.94), 12.04 (SD: 3.14) and 12.45 (SD: 2.67) for physical health, psychological health, social relationships and environmental health, respectively. No significant differences were found across different demographic characteristics (groups with small sample sizes were excluded from the ANOVA test).

3.1.2 Instruments

In addition to the SWLS (Diener et al. 1985), the brief World Health Organization Quality of Life Assessment (WHOQOL-BREF) Taiwan version (Yao et al. 2002) was used as the criterion measure. The WHOQL-BREF contains 26 standard items derived from the WHOQOL full version. It measures QOL in a general facet on health-related QOL (two

Table 4 Demographic data and the scores of the SWLS and the WHOQOL-BREF for the Study 2 participants (N = 119)

Demographic variables	Frequency (%)	SWLS Mean (SD)	PHY Mean (SD)	PSY Mean (SD)	SOC Mean (SD)	ENV Mean (SD)
Gender						
Male	52 (43.7%)	18.27 (7.67)	12.49 (2.72)	11.88 (2.84)	12.08 (2.75)	12.31 (2.45)
Female	67 (56.3%)	20.37 (8.73)	12.44 (2.67)	11.82 (3.04)	12.01 (3.43)	12.56 (2.86)
Education						
Elementary school	3 (2.5%)	24.00 (16.52)	13.14 (2.62)	13.11 (4.02)	12.44 (4.07)	12.17 (2.57)
Junior high school	14 (11.8%)	22.71 (7.00)	12.41 (2.25)	12.29 (2.38)	13.81 (2.70)	12.61 (2.35)
Senior high school	58 (48.7%)	19.40 (7.58)	12.90 (2.75)	12.15 (3.06)	12.11 (3.15)	12.49 (2.72)
College & graduate	44 (37.0%)	18.18 (8.93)	11.86 (2.70)	11.23 (2.86)	11.37 (3.06)	12.37 (2.78)
Marital status						
Single	99 (83.2%)	18.80 (8.26)	12.61 (2.73)	11.92 (3.05)	12.07 (3.16)	12.58 (2.66)
Married	15 (12.6%)	21.60 (6.08)	11.92 (1.95)	11.29 (2.15)	11.73 (3.03)	11.90 (2.20)
Divorced	4 (3.4%)	26.75 (12.82)	12.29 (3.38)	13.00 (2.75)	13.67 (2.00)	13.29 (1.65)
Missing	1 (0.8%)					

Note: PHY, PSY, SOC, and ENV were domain scores in the WHOQOL-BREF for physical health, psychological health, social relationships and environmental health, respectively

items: How would you rate your quality of life? and How satisfied are you with your health?) and four domains: physical health (seven items), psychological health (six items), social relationships (three items), and environmental health (eight items). The WHOQOL-BREF Taiwan version yielded a four-factor model, including physical, psychological, social and environmental factors (Yao et al. 2002). The internal consistency (Cronbach's α) coefficients ranged from .70 to .77. The test–retest reliability coefficients with 2–4 weeks interval ranged from .41 to .79 at item/facet level and .76 to .80 at domain level (all *p*s < .01). Content validity coefficients were in the range of .53 to .78 for item–domain correlations and 0.51 to 0.64 for inter-domain correlations (all *p*s < .01). The WHOQOL-BREF has been applied on patients with schizophrenia (e.g., Becchi et al. 2004; Chan et al. 2003a, b; Sim et al. 2004). In the current study, the internal consistency (Cronbach's α) coefficients for general facet, physical health, psychological health, social relationships, and environmental health were 0.80, 0.77, 0.80, 0.66, and 0.83. The domain scores (ranging from 4 to 20) were computed by the standard scoring algorithms of the WHO-QOL-BREF version.

3.2 Results

3.2.1 Cross-validation of psychometric properties of the SWLS

Descriptive statistics for each item and the total score of the SWLS for this sample were provided in Table 5. The results were similar to the results in Study 1. The Cronbach's α of the whole scale was 0.85 (0.84 in Study 1), indicating acceptable internal consistency of the SWLS. The results of CFA were displayed in Table 3. The χ^2 value of this model was 9.90 (df = 5, $p > 0.05$), indicating that the model can be retained. In addition, other fit indices showed that this model was acceptable (NNFI = 0.97; CFI = 0.99; RMSEA = 0.095; SRMR = 0.04). There was no improper value of parameter estimates. The squared multiple correlations for the five indicators were ranged from 0.21 to 0.91. The construct validity of the SWLS was adequate.

3.2.2 Criterion-related validity of the SWLS

Correlations between scores of the SWLS and the WHOOQL-BREF were all significant at the alpha level of 0.01. The correlations between the SWLS and the general facet and four domains of WHOQOL-BREF (physical health, psychological health, social relationships,

Table 5 Descriptive statistics of the SWLS items for the Study 2 participants ($N = 119$)

	Mean	SD	Skewness	Kurtosis	Corrected item-total correlation	Cronbach's α if item deleted
Item 1	4.03	2.15	−0.05	−1.27	0.72	0.79
Item 2	3.85	2.04	0.12	−1.12	0.69	0.80
Item 3	3.99	2.08	−0.01	−1.20	0.81	0.77
Item 4	3.99	2.09	0.00	−1.26	0.61	0.83
Item 5	3.60	2.22	0.21	−1.41	0.45	0.87
Total score	19.45	8.32	0.02	−0.75	–	–

Table 6 Normative data of the WHOQOL-BREF in Taiwan and the scores of the Study 2 participants

Domain/Group	General population[a]	Schizophrenia sample
N	13083	119
Physical health	15.05 (2.08)	12.46 (2.69)
Psychological health	13.60 (2.27)	11.85 (2.94)
Social relationships	14.39 (2.20)	12.04 (3.14)
Environment health	13.00 (2.15)	12.45 (2.67)

[a] Scores of this group was derived from the normative data of the WHOQOL-BREF in Taiwan (Yao et al. manuscript).

and environmental health) were 0.48, 0.49, 0.61, 0.48, and 0.48, respectively. These findings showed that the SWLS had positive relations with scores of the WHOOQL-BREF, supporting the criterion validity of the SWLS in assessing QOL for persons with schizophrenia living in the community. However, strengths of these correlations were moderate. This finding may also reflect that the SWLS tap different aspects of QOL from the WHOQOL-BREF (further elaboration will be presented in Sect. 4).

3.2.3 Comparison to normative data in Taiwan

Similar to Study 1, it was found that the SWLS scores of this patient group (19.45) were lower than healthy participants living in Taipei metropolitan areas (mean: 22.75, SD: 6.27; Wu 2002). Similar results of comparisons were also found in the WHOQOL-BREF scores. Persons with schizophrenia scored lower on the four domains of the WHOQOL-BREF than the national normative data collected from a sample of 13,083 people (see Table 6 for details; Yao et al. manuscript). It indicated a preliminary discriminant validity of the SWLS and the WHOQOL-BREF to detect differences in QOL between persons with schizophrenia and the general population. Quality of life in persons with schizophrenia living in the community may be an issue that deserves further attention.

4 Discussion

The purpose of this paper was to validate the SWLS for persons with schizophrenia living in the community. First, internal consistency reliability was evaluated by Cronbach's α index and the values of the two samples were satisfactory (0.84 and 0.85, respectively). Second, construct validity was examined by a single-factor model. Although there are debates on model evaluation of structural equation modeling (e.g., the usage of χ^2 test of exact fit or approximate fit indices (Barrett 2007; Bentler 2007; Goffin 2007; Hayduk et al. 2007; Markland 2007; McIntosh 2007; Miles and Shevlin 2007; Millsap 2007; Mulaik 2007; Steiger 2007); if there is a golden rule in the usage of approximate fit indices (Beauducel and Wittmann 2005; Fan and Sivo 2005; Marsh et al. 2004; Yuan 2005)), these debates would not change the conclusion of this paper. Specifically, results of χ^2 tests in both studies of this paper did not reject the single-factor model. In addition, the resultant relative model fit indices (CFI, NNFI) and the absolute model fit indices (RMSEA, SRMR) in both studies also supported a single-factor model in the SWLS. For the accounted variance of each indicator, results of squared multiple correlations were also satisfactory. All these model evaluation information revealed that the SWLS has adequate construct

validity. Finally, in Study 2, correlation analysis showed that the SWLS positively correlated with the WHOQOL-BREF, supporting the criterion-related validity of the SWLS. Therefore, it was concluded that the SWLS showed good internal consistency reliability, construct validity and criterion-related validity when administered to persons with schizophrenia living in the community.

4.1 Issues of global versus domain measures of QOL

Given the positive correlation between the SWLS and the WHOQOL-BREF, it can be said that the SWLS shows criterion validity in assessing QOL for persons with schizophrenia who live in the community. However, strengths of these correlations were moderate (r = 0.48–0.61). We think these moderate correlations reflected different approaches adopted by SWLS and the WHOQOL-BREF in assessing QOL. The SWLS concerns about general life satisfaction, and the WHOQOL-BREF concerns about domain-specific QOL. Therefore, although both of them are aimed to assess an individual's QOL, they did not tap exactly the same aspects of QOL. Hence, the correlations between these two instruments would not be very strong. Wu and Yao (in press) have examined the relationships between global (the SWLS) and domain measures (the WHOQOL-BREF) and reported that global measures and domain measures did assess the same construct on QOL, yet the measurement approaches they adopted (global or domain approach) also have substantial impact on the meaning of scores. Therefore, although the SWLS, as a global measure of QOL, shares a common factor of QOL with domains measures like the WHOQOL-BREF, these two different types of measures may provide different information of QOL (global or domain-specific).

Moreover, although there are two general items in the WHOQOL-BREF (general facet), the correlation between the general facet and the SWLS is not higher than correlations of other domains. This is because the WHOQOL-BREF concerns on health-related QOL, one of the general items only focuses on ''health'' domain, not the whole life evaluation, which results in the moderate correlation between the SWLS and the general facet of the WHOQOL-BREF. Hence, because of these two kinds of instrument utilize different approaches (global or domain-specific) to measure QOL, the moderate correlations between the SWLS and the WHOQOL-BREF could also be regarded as evidence for the criterion validity of the SWLS in assessing global QOL for persons with schizophrenia who live in the community.

The SWLS has the advantages of preserving the idiosyncratic content of life for each individual and of fulfilling the purpose of comparisons across persons or populations. As a global measurement of QOL, the SWLS has fewer items than a multiple domain measurement and is easy and quick to administer in clinical practice and research. However, it should be noted that the SWLS cannot substitute domain measures of QOL if the main purpose is to evaluate QOL in different life areas. Researchers should choose adequate measurement according to their research purposes.

4.2 Implications to the practice of psychiatric care for persons with schizophrenia living in the community

In the past decades, the healthcare delivery system has been strongly influenced by the paradigm of evidence-based practice, which requires the care of individual patients being

provided based on the best available evidence (Straus et al. 2005). In this paradigm, outcome measures used in the healthcare practice are required to be supported by evidence of adequate validity and reliability. The results presented in this paper provide the evidence of validity and reliability of the SWLS for the use in persons with schizophrenia living in the community.

Given the psychometric characteristics of the SWLS were replicated in the two studies presented in this paper, it supports that the SWLS is a reliable measure to be used in persons with schizophrenia. Persons with schizophrenia who live in the community are in a relatively stable condition, and thus are the suitable respondents for the SWLS. However, as the SWLS requires self-report by the respondent, it may not be applicable to patients with vivid psychotic symptoms, disorientation, or comprehension problems.

Many have known that schizophrenia often is a life-long illness once acquired. However, the proportion of time during which a person with schizophrenia is in relatively stable conditions and residing in the community is far more than that of acute flare-up of psychotic symptoms and residing in a hospital. In addition to the health sectors, quality of life in this particular group requires proper attention from social sectors. The results of this paper supported the SWLS as a valid measurement of quality of life in persons with schizophrenia, which may draw proper attention to psychological as well as social domains of issues in quality of life.

4.3 Research limitations and recommendations for future studies

This paper only examined the relationships between the SWLS and the WHOQOL-BREF for the criterion-related validity of the SWLS. Since the WHOQOL-BREF is a generic QOL measurement, QOL information which is specific to schizophrenia might not be included in evaluating the criterion-related validity in this paper. Hence, it is worth further examining criterion-related validity of the SWLS using measurements specifically developed for persons with schizophrenia, such as the Quality of Life Scale (QLS, Heinrichs et al. 1984), and the Quality of Life Questionnaire in Schizophrenia (S-QoL, Auquier et al. 2003).

Second, given the researchers embraced a social model which regards health and quality of life as basic rights to all humans regardless of illness conditions, psychiatric pathological severity of the study participants was not measured in either of the studies presented in this paper. Therefore, this paper is unable to provide information on how pathological severity of schizophrenia impacts on life satisfaction among the study participants. In fact, the phenomena of ‘‘disability paradox’’ has been noted in the existing literature, in which persons with medical conditions may adjust themselves to the condition and may not necessarily perceive their life situation is worsen by his or her medical conditions (Albrecht and Devlieger 1999). Nonetheless, the researchers acknowledge that other researchers who embrace different models (such the medical model) may find it necessary to investigate the relationships between life satisfaction and pathological severity of schizophrenia.

4.4 Conclusions

In conclusion, the SWLS is a quick- and easy-to-administer global measurement of subjective QOL with adequate psychometric properties for persons with schizophrenia who live in the community. Given a global measure of QOL, the SWLS allows researchers and

clinicians to compare levels of subjective QOL among individuals with schizophrenia while preserving the idiosyncratic character of life for each individual. The SWLS has potential for wider applications in psychiatric rehabilitation services and research of related fields.

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