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ORIGINAL ARTICLE

Does the Psychiatrist's Use of Subjective Well-Being Measurement in People with Schizophrenia Provide a Better Alignment with the Patient's Well-Being Perception than Clinical Judgement Alone?

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Abstract
To examine the agreement between patient and psychiatrist ratings of subjective well-being in people with schizophrenia using three well-being measurements: Satisfaction with Life, Subjective Happiness, and Subjective Well-being under Neuroleptic Treatment (SWN), including the SWN-subscale, and to investigate whether the psychiatrist's judgement or the psychiatrist-rated SWN is better at defining patient well-being. Patients with schizophrenia (n = 150) completed the three well-being measurements, then met psychiatrists, and their well-being was judged as either 'poor' or 'adequate' via the usual clinical assessment before being assessed again by the psychiatrist using the same measurements. Intra-class correlation was used to analyze the absolute agreement between 'patient-rated' and 'psychiatrist-rated' scores. Agreements on 'adequate' well-being status between patient-rated SWN (≥ 80; gold standard), psychiatrist-rated SWN, and psychiatrist's judgement were calculated using Kappa coefficients. We also calculated the sensitivity and specificity of the psychiatrist's judgement and the psychiatrist-rated SWN to define adequate well-being. SWN showed the strongest absolute agreement between patient-psychiatrist ratings (ICC = 0.7, p = 0.005), with physical functioning yielding the highest and self-control the lowest coefficients. The psychiatrist-rated SWN showed a better Kappa coefficient (0.4, p < 0.001) than the psychiatrist's judgement. Clinical judgement showed a 67% sensitivity and a 64% specificity, whereas the psychiatrist-rated SWN (score 93, AUC 81.4%) showed a 74% sensitivity and a 74% specificity for well-being prediction. The use of SWN by psychiatrists yielded a better alignment of well-being than the psychiatrist's judgement alone. The SWN subscale could help fill the gap between clinician and patient views on well-being. Psychiatrists should upskill in assessing patient wellbeing for appropriate treatment provision.

Keywords Antipsychotic agents · Judgement · Psychiatry · Schizophrenia · Self-assessment · Treatment outcome

Introduction

Research investigating the level of well-being in people with schizophrenia has gained more attention since the awareness of self-rating in schizophrenia became available. The majority of patients with schizophrenia, if not acutely psychotic or suffering from severe cognitive impairment, are able to complete self-rating scales in a consistent and reliable manner (Lindstrom et al., 2009; Naber, 1995). Their subjective evaluations have been explored, and it has been found that their well-being was of a lower level than that of healthy controls (Fervaha et al., 2016). Moreover, having low well-being scores is significantly associated with clinical symptoms such as depression, negative symptoms, and low daily functioning ability (Agid et al., 2012).

The concept of well-being constitutes a core dimension of a person's life and is based largely upon private internal psychological processes, mainly the values and subsequent goals of an individual (Diener et al., 1985, 1999; Kahneman & Tversky, 1984; Kim-Prieto et al., 2005). Recent evidence suggests that happy people generally engage in valued

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activities and goal-directed behaviors (Myers & Diener, 2018). Thus, recognizing the role of subjective views in promoting the sense of well-being is also important, and it would provide clinical usefulness in the management of people with schizophrenia by incorporating the patient's subjectivity on this matter into the holistic approach.

However, previous research has revealed discrepancies between patient-rated and clinician-assessed well-being and quality of life (QoL) (Aunjitsakul et al., 2019; Eack & Newhill, 2007; Tolman & Kurtz, 2012; Wehmeier et al., 2007). Content structures and the psychometric properties of the measurement tools could explain this discordance. It has been suggested that the achievement of a better agreement around subjective well-being between the patient and clinician assessment should be explored in detail at the subscale or sub-item level (Aunjitsakul et al., 2019).

Attitudinal and practice issues such as the different valuations of the importance of some aspects between clinicians and patients could also impact upon these discrepancies. For example, clinicians may focus more on symptom management, while patients may value social connection more. When clinician practice does not involve queries about subjective experience or when patients under-report their subjective concerns, well-being may not be measured accurately (Aunjitsakul & Pitanupong, 2018; Aunjitsakul et al., 2019; Vothknecht et al., 2013). Therefore, the above issues should be examined to provide a stronger rationale for why the consistency of the two ratings needs to be compared as well as why the standardized tools and the clinician's judgement be compared.

The present study aimed to explore the agreement between the patient and psychiatrist ratings of subjective well-being in people with schizophrenia using three well-being measurements: the Satisfaction with Life Scale (SWLS), the Subjective Happiness Scale (SHS), and the Subjective Well-being under Neuroleptic treatment Scale (SWN). Given that SWN has previously shown the highest correlation among these three instruments (Aunjitsakul et al., 2019) and that it has been designed for the self-rating of well-being under neuroleptic treatment, we explored further into its five subscales: mental functioning, self-control, emotional regulation, physical functioning, and social integration (Naber, 1995). These subscales would help to elucidate the major pitfalls common to clinicians in clinical settings. Moreover, we also investigated the performance of the psychiatrists' clinical judgement on well-being in comparison to the psychiatrist-rated well-being measurement (i.e., SWN) in determining patient well-being. Finally, we assessed the extent to which the cut-off value of the psychiatrist-rated well-being measurement SWN score can predict the patient's well-being accurately.

We hypothesized, firstly, that the use of well-being measurement tools by patients and psychiatrists would result in a high level of agreement, with SWN showing the highest agreement compared to SWLS and SHS. Secondly, we thought that the psychiatrist-rated SWN would provide a better agreement with the patient's well-being (self-evaluation) than the psychiatrist's clinical judgement. This aimed to evaluate whether the use of well-being measurement could be helpful to clinicians in obtaining a better alignment of their assessment with what patients want or how they feel.

Methods

Design and Setting

A cross-sectional study was conducted at the outpatient clinic, Department of Psychiatry, Songklanagarind Hospital, Prince of Songkla University, Southern Thailand between July 2017 and June 2018. This study was approved by the Ethics Committee of the Faculty of Medicine, Prince of Songkla University, which adheres to the provisions of the Declaration of Helsinki (REC: 60-197-03-1). All of the participants gave their informed consent before being interviewed.

Participants

People with schizophrenia, 18 years of age or older, and without active psychotic symptoms were included in this study. We excluded those with a history of hospitalization within 6 months prior to the study period, who could not communicate in Thai fluently, suffered from a serious or unstable physical illness, or were substance-dependent.

Measurement Tools

We employed three well-being measurements (SWLS, SHS and SWN) and one clinical opinion to assess well-being. The Thai version of SWLS is a self-reported questionnaire tapping into global evaluations of participants' satisfaction with life, which uses a Likert scale with scores ranging from 1 to 7. The measurement consists of five items emphasizing a conscious evaluation of one's satisfaction with life as a whole through cognitive components of subjective well-being. This scale has demonstrated good internal reliability (Cronbach alpha 0.79–0.89, mean 0.85) and temporal stability (coefficient of five items ranging 0.5–0.84, mean 0.70) (Pavot et al., 1991). SHS is also a self-reported questionnaire using a Likert scale consisting of four items regarding the global subjective evaluations of one's happiness. Similarly, it has shown an excellent internal consistency (Cronbach alpha 0.52–0.72, mean 0.62) and a test–retest reliability (coefficient of four items ranging 0.55–0.90, mean 0.72) (Lyubomirsky & Lepper, 1999). The total scores of the

SWLS and SHS are the sums of their items ranging from 5 to 35 and 4 to 28, respectively—the higher scores denote a greater satisfaction with life and happiness (Diener et al., 1985; Lyubomirsky & Lepper, 1999).

SWN is a 20-item clinical measurement, which has been developed to address well-being under neuroleptic treatment in patients with psychosis (de Haan et al., 2002). It includes five 4-item subscales: mental functioning (MF), self-control (SC), emotional regulation (ER), physical functioning (PF), and social integration (SI) (Naber, 1995); see details in Supplementary Table 1. Its responses range from 1 to 6 for each question item. Thus, each subscale score is the sum of its items, and ranges from 4 to 24. The total SWN score is the sum of all five subscales and ranges from 20 to 120 indicating poor to excellent well-being (Naber et al., 2001). The internal consistency of the SWN is good—the Cronbach alpha was found to be 0.95 for the total score and 0.73–0.88 for the five subfactors (Naber, 1995; Vothknecht et al., 2013). This scale has been proposed for defining patient well-being, i.e., either 'adequate' or 'poor' subjective well-being, using a standard cut-point score of ≥ 80 (Vothknecht et al., 2011).

Both SHS and SWN have been forward-translated into Thai by psychiatrists and then translated again into English via back-translation by an independent, professional translator. Any discrepancies were resolved by consensus with the author team. All of the translated instruments were pretested to assess their practical usage and understanding in terms of question wording, response choices, and question sequence.

Data Collection

Before collecting data, three psychiatrists were involved in a process to standardize the three well-being measurement questionnaires (SWLS, SHS, and SWN) and their clinical judgement on well-being. Regarding the psychiatrist's judgement on well-being based on the patient's clinical status, the psychiatrist would follow the usual routine practice employing a binary scale as either poor or adequate. A perfect agreement on clinical judgement of well-being (Kappa coefficient of 1, $p < 0.001$) was found among the three psychiatrists. The assessments of the SWLS, SHS, and SWN among the psychiatrists were also standardized; the intraclass correlation (ICC) coefficients were 0.953 ($p < 0.001$), 0.981 ($p < 0.001$) and 0.985 ($p < 0.001$), respectively.

During data collection, patients were invited to participate in the study at an outpatient clinic on the day of their appointments by a nurse at the clinic using the convenience sampling method; the nurse was not a part of the researcher team. The patients would freely decide whether or not they wished to take part. After signing a consent form, the patients' demo-socio-economic-health information concerning gender, age, marital status, level of education, income, employment, caregiver dependence, ability to visit the clinic on their own, duration of illness, history of hospitalization, and antipsychotic drug use was obtained. The patients were then asked to complete the three well-being measurement questionnaires, named *the patient-rated measurement* (e.g., SWN); they were either assisted by a research assistant or self-administered. The psychiatrists were blinded to the patient-rated assessment. When the patients met the psychiatrists (each patient was assessed by a single psychiatrist), their well-being was judged as either 'poor' or 'adequate' following the usual clinical assessments, named *the psychiatrist's judgement on well-being*. After that, they were also assessed by the same psychiatrist once more using the same well-being measurement questionnaires the patients had filled earlier, named *the psychiatrist-rated measurement*.

Statistical Analysis

The data entry was performed using EpiData version 3.1. The R software version 3.4.1 (R Development Core Team, 2012) was used for data analyses. Categorical variables were presented as both frequencies and percentages, whilst continuous variables were presented as means with standard deviations or median with inter-quartiles. The unpaired t-test and the rank-sum test were used to compare continuous data, including the wellbeing scale ratings. The Chi-square test and Fisher's exact test were performed to compare categorical data. The absolute agreement of each well-being measurement (SWLS, SHS or SWN) and within the SWN subscales between patients and psychiatrists were analyzed using ICC coefficients (with the 'two way' model, 'agreement' type, and 'average' unit) (Hallgren, 2012).

To investigate which psychiatrist's assessment provided a better performance regarding patient well-being, we calculated the Kappa coefficient of the (1) psychiatrist's judgement on well-being and (2) the psychiatrist-rated SWN using the patient self-rated SWN as the gold standard (SWN total scores ≥ 80). The reason for this was the fact that the self-rated SWN has been developed specifically for the purpose of patients scoring their own subjective well-being. The implication would be useful to determine the best way—clinical judgement or SWN—clinicians could utilize in order to assess patient well-being as closely as possible to the self-rated one. The sensitivity and specificity values of the psychiatrist's judgement versus the psychiatrist-rated SWN were also analyzed. Additionally, the inter-rater reliability was evaluated with an ICC of at least 0.70 considered an acceptable value (Polit, 2014), a Kappa coefficient of 0.21–0.39 representing the minimal value to indicate agreement, and a Kappa coefficient of 0.40–0.59 denoting a weak agreement (McHugh, 2012). A p-value of less than 0.05 was considered to indicate statistical significance.

Table 1 Demographic characteristics and medical history of patients with schizophrenia (n = 150)

Variable	Total; N (%)	Adequate well-being[a] (n = 89)	Poor well-being[a] (n = 61)	Chi-square p-value
Gender (Male)	76 (50.7)	44 (49.4)	32 (52.5)	0.84
Age (years) (± SD)	42.7 (± 12.1)	42.6 (± 12.3)	42.9 (± 11.9)	0.14[b]
Marital status				0.77[c]
Single	107 (71.3)	63 (70.8)	44 (72.1)	
Married	35 (23.3)	22 (24.7)	13 (21.3)	
Separated/widowed/divorced	8 (5.3)	4 (4.5)	4 (6.6)	
Education				0.22[c]
Primary school or none	20 (13.3)	9 (10.1)	11(18.0)	
Junior high school	12 (8.0)	7 (7.9)	5 (8.2)	
Senior high school	42 (28.0)	25 (28.1)	17 (27.9)	
Vocational degree	22 (14.7)	14 (15.7)	8 (13.1)	
Bachelor's degree	47 (31.3)	27 (30.3)	20 (32.8)	
Higher than Bachelor's degree	7 (4.7)	7 (7.9)	0 (0)	
Monthly income (USD)[e]				0.72
None	33 (22.0)	19 (21.3)	14 (23.0)	
< 65	21 (14.0)	11 (12.4)	10 (16.4)	
65–165	25 (16.7)	14 (15.7)	11 (18.0)	
166–330	34 (22.7)	19 (21.3)	15 (24.6)	
331–660	21 (14.0)	14 (15.7)	7 (11.5)	
> 661	16 (10.47)	12 (13.5)	4 (6.6)	
Occupation				0.03
Employed	86 (57.3)	58 (65.2)	28 (45.9)	
Blue-collar employee	16 (10.7)	9 (10.1)	7 (11.5)	
Private retailer	24 (16.0)	12 (13.5)	12 (19.7)	
Government employee	16 (10.7)	14 (15.7)	2 (3.3)	
Private company employee	7 (4.7)	6 (6.7)	1 (1.6)	
Private business owner	7 (4.7)	6 (6.7)	1 (1.6)	
Agriculturalist	16 (10.7)	11 (12.4)	5 (8.2)	
Unemployed	64 (42.7)	31 (34.8)	33 (54.1)	
Self-visitation of clinic	86 (57.3)	51 (57.3)	35 (57.4)	1
Caregiver independence	104 (69.3)	60 (67.4)	44 (72.1)	0.66
Duration of illness (years) (median [IQR])	11 (5, 13)	11 (5, 20)	11 (5, 18)	0.89[d]
History of hospitalization	86 (57.3)	52 (58.4)	34 (55.7)	0.87
Current antipsychotic treatment				0.82[c]
Typical antipsychotic drug	63 (42.0)	40 (44.9)	23 (37.7)	
Atypical antipsychotic drug	40 (26.7)	23 (25.8)	17 (27.9)	
Both types of drug	44 (29.3)	24 (27.0)	20 (32.8)	
None	3 (2.0)	2 (2.2)	1 (1.6)	

[a]Patient-rated SWN score of < 80 and ≥ 80, determined to indicate poor and adequate well-being, respectively

[b]Unpaired t-test was used to compare variables between adequate and poor well-being groups

[c]Fisher's exact test was used to compare variables between adequate and poor well-being groups

[d]Rank-sum test was used to compare between adequate and poor well-being groups

[e]1 USD = 30.36 Baht (Source: Bank of Thailand [Foreign Exchange Rates as of 25 November, 2020]). Retrieved from URL: https://www.bot.or.th/english/statistics/financialmarkets/exchangerate/_layouts/application/exchangerate/exchangerate.aspx

To assess validity, subjective well-being scores (SWN scores rated by patients and psychiatrists) and the psychiatrist's judgement on well-being were analyzed in relation to the objective measures of well-being (objective functioning), which are level of education, income, employment status, caregiver dependence, and ability to visit the clinic by

oneself. The other demographic and health variables—gender, age, duration of illness, and history of hospitalization—were also analyzed, since work and living independence status have some potential in determining objective quality of life (Lehman, 1988), and the patients' impression of well-being could be affected by their mood states or physical conditions (Strassnig et al., 2018). Therefore, further analysis using collected objective data is a worthwhile endeavor to help validate the assessment of subjective well-being. The linear regression model was used to evaluate associations between subjective well-being scores and objective functioning indicators, including other demographic and health variables. Meanwhile, the logistic regression model was employed to evaluate associations between the psychiatrist's judgement on well-being and objective functioning indicators, including other demographic and health variables.

Results

Patient Characteristics

150 patients (50.7% male) with schizophrenia were included; their mean age (SD) was 42.7 (12.1) years, and it ranged from 18 to 70 years. More than half of the patients were single. The employed patients made up the greatest proportion, approximately three-fifths, compared to those who were unemployed. The majority of patients were able to visit the clinic by themselves (n = 86, 57.3%) and lived without a caregiver (n = 104, 69.3%). The median illness duration was 11 (IQR 5, 13) years (Table 1).

The patient characteristics between adequate and poor well-being were compared using a patient self-rated SWN score of ≥ 80 as an indication of an adequate status. It was found that being unemployed was significantly associated with a poor well-being status ($X^2(1, 150) = 4.73$, p = 0.03) (Table 1).

The Scores of the Three Well-Being Measurements

The mean scores of the three well-being measurements (SWLS, SHS and SWN) between the patient and psychiatrist assessments are presented in Table 2. The means of patient self-rated SWLS and SWN scores were significantly lower than the psychiatrist-rated ones. Regarding the SWN subscales, all of the patient-rated scores were also significantly lower than the psychiatrist-rated scores. The self-control domain showed the widest difference gap in terms of the mean between the two raters, whereas physical functioning showed the smallest gap (Table 2). The detailed information related to SWN items between patient and psychiatrist assessments is presented in Supplementary Table1.

The ICCs of the Three Well-Being Measurements and the SWN Subscales

The absolute agreements analyzed using ICC coefficients were statistically significant in all measurements (Table 2). The SWN demonstrated an acceptable absolute agreement (ICC = 0.7, $p = 0.005$); it was the highest ICC value compared to that of SWLS (ICC = 0.6, $p < 0.001$) and SHS (ICC = 0.6, $p < 0.001$). With reference to the SWN subscales, PF presented the greatest absolute agreement (ICC = 0.8, $p < 0.001$), followed by MF (ICC = 0.7, $p < 0.001$), ER (ICC = 0.6, $p < 0.001$), SI (ICC = 0.6, $p = 0.001$), and SC (ICC = 0.4, $p = 0.05$).

Table 2 Mean scores and intra-class correlation coefficients (absolute agreement) of SWLS, SHS, SWN and SWN subscales between patient and psychiatrist assessments

Measurements	Patient-rated score	Psychiatrist- rated score	p-value[a]	ICC coefficients
SWLS	22.4 ± 6.1	24.0 ± 5.5	0.002	0.6 (p < 0.001)
SHS	19.2 ± 4.3	20.7 ± 4.4	< 0.001	0.6 (p < 0.001)
SWN	83.7 ± 13.0	92.6 ± 16.2	< 0.001	0.7 (p = 0.005)
SWN subscales				
MF	16.5 ± 3.7	17.9 ± 4.0	0.004	0.7 (p < 0.001)
SC	15.3 ± 2.9	18.1 ± 3.7	< 0.001	0.4 (p = 0.05)
ER	17.2 ± 3.2	18.8 ± 3.5	< 0.001	0.6 (p < 0.001)
PF	17.5 ± 3.7	18.6 ± 4.2	0.014	0.8 (p < 0.001)
SI	17.1 ± 3.4	19.2 ± 3.9	< 0.001	0.6 (p = 0.001)

ICC intra-class correlation, *SWLS* Satisfaction with Life Scale, *SHS* Subjective Happiness Scale, *SWN* Subjective Well-being under Neuroleptic Treatment Scale, *MF* mental functioning, *SC* self-control, *ER* emotional regulation, *PF* physical functioning, *SI* social integration

[a]Unpaired t-test was used to compare between patient- and psychiatrist-rated scores

Table 3 Kappa agreement between patient-rated SWN, psychiatrist-rated SWN, and the psychiatrist's judgement taking a SWN score of ≥ 80 to indicate adequate well-being

Psychiatrist assessments	Patient-rated SWN		Kappa coefficients
	Same group n (%)	Different group n (%)	
Psychiatrist judgement	101 (67.3)	49 (32.7)	0.3 ($p < 0.001$)
Psychiatrist-rated SWN	109 (74.1)	38 (25.9)	0.4 ($p < 0.001$)

Psychiatrist-rated SWN data were missing on three occasions, yielding a total number of 147 evaluations

SWN Subjective Well-being under Neuroleptic Treatment Scale

Table 4 Sensitivity, specificity, and positive and negative predictive values of psychiatrist's judgement versus psychiatrist-rated SWN to evaluate patient well-being (a patient-rated SWN score of ≥ 80 as considered the gold standard)

Psychiatrist's assessments	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Remark
Psychiatrist's judgement	69.66	63.93	73.81	59.09	–
Psychiatrist-rated SWN score					
93	74.42	73.77	80.00	67.16	Maximum sensitivity and specificity
80	96.51	42.62	70.34	89.66	Standard cut-point
73	100	32.79	67.72	100	Maximum sensitivity

NPV negative predictive value; *PPV* positive predictive value; *SWN* Subjective Well-being under Neuroleptic Treatment Scale

Agreement on Classifying Patients into the Same Categories of Either Adequate or Poor Well-Being Between the Patient-Rated SWN and the Psychiatrist-Rated SWN, and the Psychiatrists' Judgement on Well-Being

Of the 150 patients with schizophrenia, 89 (59.3%) had 'adequate well-being' (defined by a patient-rated SWN score of ≥ 80 as the gold standard). On the other hand, patients with adequate well-being accounted for 118 (78.7%) of the total, when a psychiatrist-rated SWN score of ≥ 80 was applied, and for 84 (56.0%) according to the psychiatrist's judgement. The agreement between patient-rated SWN and psychiatrist-rated SWN on classifying patients into either adequate or poor well-being showed a Kappa coefficient of 0.4 ($p < 0.001$), which was higher than the one for the agreement between patient-rated SWN and the psychiatrist's judgement (Kappa = 0.3, $p < 0.001$) (Table 3).

Sensitivity and Specificity of Psychiatrist's Judgement on Well-Bring Versus Psychiatrist-Rated SWN, Taking the Patient-Rated SWN as the Gold Standard

The psychiatrist's judgement on patient well-being (either 'poor' or 'adequate' status) showed low sensitivity (70%) and low specificity (64%) for well-being prediction (Table 4). On the other hand, the psychiatrist-rated SWN demonstrated a good ability to predict well-being. In the ROC curve analysis, the psychiatrist-rated SWN showed an area of 81.4% under the curve (95% CI 74.3–88.6, Fig. 1). A score of 93 showed the maximum sensitivity (74%) and specificity (74%), while a score of 73 showed the highest sensitivity (100%). We also calculated the sensitivity and specificity of the standard cut-point (score 80) of the psychiatrist-rated SWN, accounted for 97% and 43%, respectively.

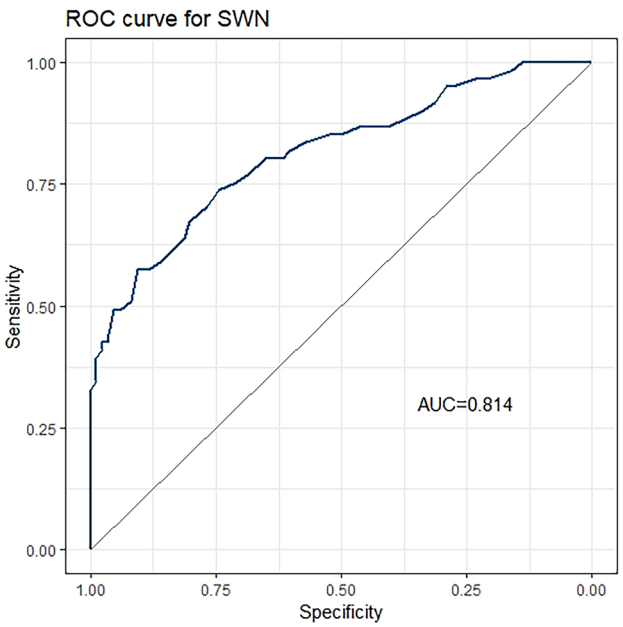

Fig. 1 The ROC curve of the psychiatrist-rated SWN to evaluate patient well-being (a patient-rated SWN score of ≥ 80 as considered the gold standard)

Validity Assessment

Validity was assessed through regression analysis with key variables (Table 5). Among the objective functioning indicators, being employed was associated significantly with higher patient- and psychiatrist-rated SWN scores; it was also associated with an adequate well-being status determined by the psychiatrist's judgement. Meanwhile, level of income was related to the psychiatrist's judgement on well-being but not to the patient- or psychiatrist-rated SWN. In addition, neither one's ability to visit the clinic on one's own nor caregiver dependence were related to any of the well-being assessments. Lastly, gender, age, education, duration of illness, and history of hospitalization were also unrelated to any of the well-being assessments.

Discussion

This study aimed to determine the strongest agreement between patient and psychiatrist assessments of well-being using three well-being instruments; SWN showed the

Table 5 Validity measures of the three well-being assessments in relation to objective functioning indicators, demographic and health variables, using a univariate regression analysis

Variables	Patient-rated SWN score[a] (n = 150)		Psychiatrist-rated SWN score[a] (n = 147)		Psychiatrist judgement[b] (n = 147)	
	B (95% CI)	p-value	B (95% CI)	p-value	Crude Odds Ratio (95% CI)	p-value Wald test
Gender (ref: male)	1.41 (− 2.75, 5.56)	0.51	2.93 (− 2.30, 8.17)	0.27	1.03 (0.54, 1.98)	0.92
Age (years)	− 0.10 (− 0.28, 0.07)	0.24	− 0.09 (− 0.31, 0.12)	0.40	0.99 (0.96, 1.01)	0.29
Education (ref: primary school or none)						0.23[c]
Junior high school	0.57 (− 8.70, 9.84)	0.90	− 6.40 (− 17.82, 5.03)	0.28	1.86 (0.40, 8.69)	0.43
Senior high school	3.54 (− 3.35, 10.44)	0.32	4.57 (− 4.03, 13.17)	0.30	2.37 (0.78, 7.18)	0.13
Vocational degree	4.58 (− 3.26, 12.43)	0.25	4.65 (− 5.06, 14.36)	0.35	4.95 (1.33, 18.41)	0.02
Bachelor's degree	4.18 (− 2.60, 10.95)	0.23	4.45 (− 4.00, 12.91)	0.30	2.99 (1.01, 8.91)	0.05
Higher than Bachelor's degree	11.76 (0.61, 22.90)	0.04	18.25 (4.54, 31.95)	0.01	2.48 (0.43, 14.34)	0.31
Monthly income (USD) (ref: none)[d]	0.83 (− 0.43, 2.09)	0.20				0.01[c]
< 65	− 2.59 (− 9.74, 4.55)	0.48	− 5.85 (− 14.65, 2.96)	0.20	1.06 (0.33, 3.33)	0.93
65–165	− 0.53 (− 7.32, 6.26)	0.88	2.77 (− 5.60, 11.14)	0.52	1.72 (0.59, 4.98)	0.32
166–330	0.82 (− 5.44, 7.07)	0.80	4.28 (− 3.56, 12.12)	0.29	4.40 (1.54, 12.57)	0.01
331–660	2.55 (− 4.60, 9.70)	0.49	2.92 (− 5.89, 11.73)	0.52	5.07 (1.47, 17.46)	0.01
> 661	3.41 (− 4.39, 11.21)	0.39	8.00 (− 1.60, 17.60)	0.11	2.64 (0.76, 9.15)	0.13
Employment (ref: unemployment)	4.95 (0.82, 9.08)	0.02	8.53 (3.41, 13.66)	0.001	3.15 (1.59, 6.24)	0.001
Self-visitation of clinic (ref: accompanied by a relative)	1.45 (− 2.75, 5.66)	0.50	2.97 (− 2.31, 8.25)	0.27	1.18 (0.61, 2.28)	0.63
Caregiver independence	2.05 (− 2.45, 6.55)	0.37	1.12 (− 4.49, 6.84)	0.69	0.86 (0.42, 1.75)	0.68
Duration of illness (years)	− 0.19 (− 0.41, 0.04)	0.10	− 0.29 (− 0.58, − 0.002)	< 0.05	0.97 (0.93, 1.00)	0.07
History of hospitalization	1.00 (− 3.21, 5.20)	0.64	2.17 (− 3.13, 7.47)	0.42	0.94 (0.48, 1.82)	0.85

Psychiatrist-rated SWN and psychiatrist judgement data were missing on three occasions, yielding a total number of 147 evaluations

SWN Subjective Well-being under Neuroleptic Treatment Scale

[a]A linear regression analysis was used for patient- and psychiatrist-rated SWN scores. The results of the multiple linear regression analyses are not shown because unemployment was the only objective functioning indicator associated with the patient-rated SWN (B 7.35 [95% CI, 1.54, 13.17], p = 0.014) and the psychiatrist-rated SWN (B 9.72 [95% CI, 2.8, 16.65], p = 0.007). A higher score indicates a higher well-being level

[b]The odds ratio of the psychiatrist's judgement to assess adequate well-being was analyzed using a logistic regression analysis. The multiple logistic regression analysis of the psychiatrist's judgement did not show any statistically significant variable

[c]Likelihood Ratio Test

[d]1 USD = 30.36 Baht (Source: Bank of Thailand [Foreign Exchange Rates as of 25 November 2020]). Retrieved from URL: https://www.bot.or.th/english/statistics/financialmarkets/exchangerate/_layouts/application/exchangerate/exchangerate.aspx

highest ICC value compared to SWLS and SHS. The second major finding was that discrepancies in the SWN subscales were detected; SC showed the lowest agreement, whereas PF exhibited the highest level. Notably, the psychiatrist ratings of the SWN subscales typically gave higher scores than did those of the patients themselves. Thus, the chief contribution of this study is the confirmation that there remains a gap in the perception of subjective well-being between the patients' and the clinicians' point of view. Regarding the Kappa analysis, the psychiatrist-rated SWN showed better agreement than the psychiatrist's judgement; nevertheless, the Kappa values were considered to indicate weak agreement. We also assessed the usefulness of utilizing the psychiatrist-rated SWN in clinical practice; to that end, the ROC curve was analyzed, and cut-point values to assess patient well-being categorically were suggested.

In respect to the first research question—"Which of the well-being measurements would provide the best alignment between patient and psychiatrist ratings?"—as predicted, the SWN measurement showed the greatest absolute agreement (ICC 0.7, $p = 0.005$), which could be considered as an acceptable level of agreement. Our results showed a similar trend of well-being to those reported in an earlier study (Aunjitsakul et al., 2019). SWLS and SHS also showed a significant but unacceptable absolute agreement level.

Considering the ICC results, it could be said that the evaluation of patient well-being differs between assessors. The patients and psychiatrists showed fewer discrepancies on SWN than on the other measurement tools, which could be explained by the fact that this instrument is developed specifically for assessing the subjective well-being of people with schizophrenia under treatment with neuroleptic drugs (Naber et al., 2001), while the other two are designed to evaluate different psychometric constructs. It would be very helpful to us, clinicians or psychiatrists, to know that such a gap exists in the clinical management of patients in real-life practice.

Notably, our findings may help to fill the gap that make psychiatrists prone to be pitfall. Regarding this issue, the absolute agreement of the SWN subscales showed a diversity in ICCs (0.4 to 0.8); from the lowest to the highest, they were SC, SI, ER, MF, and PF. This finding is in accord with earlier observations, suggesting that people with schizophrenia are subjectively concerned about the effects of antipsychotic medications as demonstrated by their acute awareness regarding their daily functioning as well as their cognitive abilities (Naber et al., 2005; Ritsner et al., 2012). As a result, the patient's health complaints, related to both physical and mental functioning, could be relatively well-represented in the clinician's treatment plan.

Furthermore, all of the SWN subscale scores rated by the patients were lower than the scores rated by the psychiatrists, and the SC subscale presented the widest difference in the total mean scores among the two ratings (Table 2). These outcomes could clarify our view of the sense of well-being between raters. Besides, the higher scores rated by psychiatrists may reflect the already known pitfalls in practice, such as taking different valuations of symptoms or social connection information from the patient's point of view, clinical evaluations not being able to measure accurately regardless of the consideration of subjective experiences, or the clinician's lack of experience or evaluation skills related to patient well-being. These findings of differences in subscale scores raise intriguing issues regarding the well-being of people with schizophrenia by pointing toward the role of factors beyond merely biological aspects (i.e., PF and MF), such as psychosocial aspects like ER, SI and SC. Hence, more active collaboration and information sharing are required in practice to tackle this problem (Hamm et al., 2018).

Regarding the psychopathology of schizophrenia, those experiencing active psychoses might find it difficult to regulate themselves, while for those having negative symptoms, it might be hard to be aware of their exact emotions. Due to these clinical conditions, an agreement between the patient and the psychiatrist regarding ER, SI and SC might be arduous to reach. Similarly, former studies have had the tendency to partly miss this point owing to ignorance concerning the negative effects of antipsychotic drugs and different expectations regarding treatment between the patient and the psychiatrist (Chue, 2006; Seale et al., 2007). Patients may under-report subjective concerns due to fear of being labeled as difficult patients (Frosch et al., 2012). This might also affect the well-being assessments.

Since the SWN tool showed the strongest ICC correlation between patients and psychiatrists, it could be inferred that the objective well-being assessment by the psychiatrist was rather close to that of the subjective well-being assessment by the patient. In turn, when looking at classifying patients into an 'adequate' or 'poor' well-being status, the second research question asked whether psychiatrist-rated SWN provides a better agreement than the psychiatrist's judgement, using the patient-rated SWN as a gold standard and a score of ≥ 80 to indicate adequate well-being. It was discovered that the psychiatrist-rated SWN was better than one's self-judgement of well-being status; both Kappa coefficients were considered as weak (0.4, $p < 0.001$), and minimal agreement was observed (0.3, $p < 0.001$). These Kappa coefficient agreements could help guide the overall picture of well-being evaluated by patients and psychiatrists, but they also point to a substantial loss of information in relation to inter-rater agreement.

Regarding the important issue of the authoritarian practice (Frosch et al., 2012), clinicians may assume that they know about the patients' well-being better than the patients themselves. Additionally, clinicians may judge patients in

a stigmatizing manner—i.e., the patients cannot decide on their own how they were doing—and doubt their judgement on well-being. Our findings showed that the psychiatrist's judgement was poor in determining patient well-being, highlighting the fact that clinicians are not always accurate in their assessments and, to some extent, tend to over- or underestimate patient well-being. Thus, with recovery-oriented treatment it requires to move beyond positioning health care provider as experts and begin to more carefully study the views of recovering persons (Leonhardt et al., 2017) to create their own meanings of well-being experiences.

Furthermore, we analyzed descriptive values to gain a more complete picture of the information agreement by looking at the sensitivity and specificity, the positive predictive value, and the negative predictive value of our instruments. Regarding sensitivity, the psychiatrist-rated SWN with a cut-point of 80 was better than the psychiatrist's judgement. Thus, we could imply that the psychiatrist-rated SWN score is more useful than using clinical judgement to assess patient well-being. Moreover, the ROC curve of the psychiatrist-rated SWN showed a good level of prediction (AUROC = 81.4%), meanwhile, the psychiatrist's judgement had the poorest prediction power of determining patient well-being. The findings of the analyses of the ROC curve and the sensitivity or specificity of the psychiatrist-rated SWN by this study's three psychiatrists may be suggestive of the inaccuracies being solely due to the practice particulars and experience level of the individual psychiatrist, and not due to use of the tool. It is appropriate to test the sensitivity and specificity of the psychiatrist's judgement and the consistency of his/her scoring in order to determine a standard cut score that be applicable in wider settings and/or among different mental healthcare professionals. Nevertheless, the psychiatrist's judgement might be affected by the pitfalls and the authoritarian issues discussed above.

We also found the cut-off values of the total score of SWN rated by psychiatrists, with 93 showing the maximum sensitivity and specificity, and 73 the only value showing maximum sensitivity. Meanwhile, the standard cut-point of 80, which fell between 73 and 93, showed a rather high sensitivity but low specificity. Taking these well-being prediction values into account, using only the psychiatrist's judgement on well-being seems to be inadequate; therefore, integrating the SWN tool into routine practice could ensure a more accurate well-being prediction than the clinician's opinion alone. Further details on the use of the psychiatrist-rated SWN score and the relevant cut-point values are presented in Table 6.

Another point of concern, regardless of reliability, is the validity of well-being assessment between patients and psychiatrists. Using observable objective data (e.g., current functioning, being employed, and living independence) (Lambert et al., 2006) or demographic or health data could improve the validity of the assessment. Nevertheless, objective data were not our primary concern because we believed that subjective views rather than measuring the individual's functioning, work and social life, or impairment status have an important role to play in ascertaining well-being. Some patients may be happy with their current status, and some may not. For example, previous research examining QoL has shown that patients living with their parents did not see themselves as more disabled than those living on their own (Strassnig et al., 2018). However, it is still worthwhile to validate subjective outcomes with observable and objective data, since patients' emotional and physical fitness could affect their perception of subjective experiences (Strassnig et al., 2018). Taking observable objective data into account (e.g., employment, ability to visit the clinic on one's own, and caregiver independence), we found that being employed could play a role in indicating well-being status irrespective of patient or psychiatrist assessment. Previous work has also pointed out that employment could help assess the status of a patient's well-being (Lambert et al., 2006). Additionally, visiting the clinic on one's own and caregiver independence were not found to play a role in well-being assessment. Moreover, there is a tendency on the part of patients to ignore their life status, resulting in it having no association with well-being outcomes. These post-hoc findings warrant the employment of more observable and objective information in the clinical setting in order to improve the clinicians' assessment of patient well-being. Meanwhile, functioning and impairment remain important issues to be addressed in future research.

There were some limitations to this study. Firstly, the patient-rated scores might have been affected by individual factors (e.g., patient's mood/physical conditions), which

Table 6 The use of the psychiatrist-rated SWN score and recommendations

Psychiatrist-rated SWN score	Well-being status	Recommendations
≤ 73	Inadequate	Reassessment of bio-psycho-social aspects or all features of the SWN subscales
73–93	Probably adequate	Reassessment of some aspects of the subscales
≥ 93	Possibly adequate	Regular clinical follow-up

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could have compromised the validity of assessment between raters. Hence, we performed validity assessments by comparing objective data with well-being outcomes in order to ensure an improved validity. Secondly, considering the psychopathology of schizophrenia, some patients have problems with communication (Langdon et al., 2002), which may have led to unreliable data. Thirdly, there might have been some influence exerted by the judgment of the psychiatrist in regard to the sequential measurements in the questionnaires, as this study was not conducted in a totally blind fashion. Furthermore, the extent of one's sense or feeling of well-being and its determinants needs to be investigated more longitudinally in order to examine subtle changes throughout the course of the mental illness.

To our knowledge, this is the first study to shed some light on the patient's subjective well-being assessed by psychiatrists and to employ a large sample size. From the clinical point of vantage, it is really important to reassess patients systematically. This would lead to a better patient satisfaction with life and overall happiness, which would enhance their QoL (Aunjitsakul & Pitanupong, 2018; Wehmeier et al., 2007). The happiness of patients with schizophrenia could ensure a successful long-term management, which could yield better treatment outcomes as it would enable the psychiatrist to attend closely to the patients' needs and have a meaningful relationship with them (Acosta et al., 2012; Gunnmo & Bergman, 2011; Higashi et al., 2013; Rettenbacher et al., 2004). This study could help heighten awareness regarding the need to finetune the assessment of the patient's needs via a strong cooperation between the patient and the clinician. The importance of this is highlighted by literature on recovery which emphasizes that recovery has to be self-directed (Leonhardt et al., 2017) as such there is a need for more active collaboration and information sharing as suggested by our findings. The social relationships of the patient with others as well as health professionals could promote their overall satisfaction with life (Gunnmo & Bergman, 2011). Furthermore, the utilization of psychiatrist-rated well-being instruments with their appropriate cut-points could be useful in daily practice.

In conclusion, we found that SWN can be used by psychiatrists as an acceptable agreement level in total scores between psychiatrists and patients with schizophrenia was observed; however, the agreement between the two assessments on determining well-being status was weak. Three clinical implications emerge from the findings of the present study. Firstly, well-being is predicted more accurately by the psychiatrist-rated SWN than the psychiatrist's judgement alone. Secondly, psychiatrists or clinicians should be trained adequately in order to ensure their ability to measure well-being accurately, and the well-being measurements employed should be standardized. Thirdly, psychiatrists may need to be upskilled in assessing patient well-being as a way to inform the appropriate treatment provision. Finally, the investigation of subjective well-being as well as the improvement of clinical outcomes and their evaluation along their longitudinal course should be further explored in the future.

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Data Availability The data that support the findings of this study are available from the corresponding author, WA, upon reasonable request.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Consent for Publication All authors agreed to submit this study for publication.

Ethical Approval The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation as well as the Helsinki Declaration of 1975, as revised in 2008. This study was approved by the Ethics Committee of the Faculty of Medicine, Prince of Songkla University (REC: 60-197-03-1).

Informed Consent All the participants gave their informed consent before being interviewed.

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