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Validity and Reliability of the Persian Version of the "Quality of Life Scale" in Schizophrenia

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Abstract

Background: There are still controversies around the most accurate way to assess the quality of life in patients with schizophrenia. The "quality of life scale" (QLS) was designed to assess the quality of life of non-hospitalized patients with schizophrenia, regardless of their florid psychotic symptoms.

Objectives: To validate the Persian version of the "quality of life scale" (QLS) in assessing the quality of life of patients with schizophrenia.

Methods: Clinically stable outpatients with schizophrenia referred to Roozbeh hospital, Tehran University of Medical Sciences, as well as 75 healthy participants from September 2016 to March 2017 were enrolled. The QLS was translated following the WHO guidance. To evaluate the face and content validity, a group of experts were gathered to examine the conceptual structure, translation, and back-translation. To evaluate the convergent and discriminant validity, the world health organization quality of life-bref (WHOQOL-BREF), and the global assessment of functioning (GAF) were administered to 85 patients with schizophrenia and 75 healthy controls. To evaluate inter-rater reliability, two independent raters simultaneously assessed 52 patients.

Results: Content validity index regarding relevance and clarity were 0.91 and 0.97, respectively. The discriminant validity assessment comparing the scores of the patients and the control group showed significant differences in all domains. The QLS scores had a positive correlation with GAF scores. No significant correlation was observed between the QLS and the WHOQOL-BREF domain scores among patients. Across different categories, Cronbach's alphas were 0.90 for the interpersonal relations, 0.43 for the instrumental role, 0.95 for intrapsychic foundations, and 0.86 for the common objects and activities. The intra-class correlation (ICC) coefficients were more than 0.98 within all four domains.

Conclusions: The Persian version of the QLS possesses desirable validity and reliability indices. The scale seems to measure disease-specific aspects of quality of life when compared with more generic and self-rating instruments such as the WHOQOL-BREF.

Keywords: Schizophrenia, Quality of Life, Psychometrics

1. Background

Schizophrenia is a chronic disease that affects many aspects of life including social activities and sense of well-being (1). The manifestation of the disorder varies across individuals and over time, however, the outcome is usually severe and persistent. About 75% of people with severe schizophrenia are disabled and unemployed, resulting in significant burden on the health system (2). Despite the severity of the illness, only half of the patients with schizophrenia are referred for treatment (3). Therefore, interventions with the aim of relapse prevention and improving quality of life seem quite beneficial.

Although, the quality of life of patients with schizophrenia has been the focus of many studies, there are still controversies around the most accurate way to assess the quality of life in this group of patients (4). Karow et al. (1), showed using 35 different generic and specific QoL scales in more than 400 studies in patients with schizophrenia. Among the generic QoL scales, most widely used were the WHO-quality of life interview (WHO-QO.L-.Bref) (5), the short form 36 or short form 12 (6), and the

EuroQOL (7). The most often used schizophrenia-specific QOL scales were the Heinrichs-Carpenter quality of life scale (QLS) (8), the quality of life, enjoyment, and satisfaction questionnaire 18 (9), and the subjective wellbeing under neuroleptics (10). Additionally, a disease-specific QoL scale, the schizophrenia QoL scale (SQLS) (11) is translated to Persian and validated for use in Iranian patients (12). Some studies have reported that cognitive impairment and negative symptoms of patients might influence the reliability of subjective and self-administered questionnaires assessing the quality of life. To resolve this issue, some investigators have suggested to assess the quality of life of these patients by more specific tools such as interview by an expert (13). Patient-rated subjective QoL scales and the observer-rated QoL scales are moderately positively correlated (14). They are inversely correlated with productive symptoms of schizophrenia and depressive symptoms, and directly correlated with functioning scores. However, they are influenced by diverse factors. The patient-rated QoL scales are more influenced by depressive symptoms, and the observer-rated QoL scales are more influenced by negative symptoms (14).

The "quality of life scale" (QLS) was designed by Heinrichs et al. (8) to assess the current functioning of non-hospitalized patients with schizophrenia, regardless of their florid psychotic symptoms. It evaluates the richness of personal experiences, the quality of interpersonal relations, and productivity in occupational roles. It should be administered as a semi-structured interview. The scale items conceptually belong to the four categories including: intrapsychic foundation, interpersonal relationships, instrumental role, and common objects and activities. The intrapsychic foundations items elicit judgments about the dimensions of cognition, volition, and affectivity, the interpersonal relations items focus on the various aspects of social experience and interpersonal relationships, the instrumental role items relate to the judgments about the level of accomplishment and satisfaction derived from the different roles, and finally, the objects and activities items focus on the possession of common objects and the engagement in the regular activities (8). The QLS specifically addresses more insidious aspects of schizophrenia as they may have a greater influence on the quality of life. To the best of our knowledge, the QLS has been validated and used in French (15) and Indian languages (16). In addition, an abbreviated version has been validated in Canada (17).

2. Objectives

The aim of this study was to determine the validity and reliability of the Persian version of the QLS as a specific tool to assess the quality of life of patients with schizophrenia.

3. Materials and Methods

This validation study of the Persian version of "quality of life scale" in schizophrenia was conducted in the Roozbeh hospital, Tehran University of Medical Sciences from September 2016 to March 2017. The study population consisted of patients with schizophrenia referred to the Roozbeh hospital's outpatient clinic, a referral mental health center in Tehran, Iran. Diagnosis was made using the registered diagnosis on the medical records that was confirmed by clinical interview based on the DSM-IV-TR criteria. A total of 85 patients, from both sexes, were consecutively enrolled in this study by using convenience sampling. A total of 75 healthy adults from the hospital staff were also recruited. The healthy controls would have been enrolled if there has been no evidence for any axis I disorders or a history of major mental illness in clinical interview. Participants also matched with the patient group based on age, and gender. All participants were between 18 and 64 years of age, and Farsi speakers. Based on history, examination, and clinical interview there was no significant psychiatric illness or systemic medical condition in the control group. The exclusion criteria included communication problems, speech difficulties, severe behavioral disturbances, and prominent cognitive disturbances, in a way that a person cannot perform an interview (such as agitation or acute psychosis). Demographic data were gathered through clinical interviews and patients' records by using a researcher-made questionnaire.

The participants were evaluated for the severity of depression using the 24-item Hamilton depression rating scale (HDRS). Those who had a HDRS score of 7 or higher were excluded from the study (18). All participants completed the WHOQOL-BREF as a generic instrument for assessing the quality of life. Functioning was evaluated using the global assessment of functioning (GAF) (19).

The QLS is a 21-item scale providing information on the patients' condition during the preceding four weeks. It should be administered by a trained clinician. Each item includes a brief description of the item to focus the interviewer on the conclusion to be made, a set of suggested probe statements, the seven-point scale with descriptive anchors for each point. There are no normal and abnormal range scores for QLS; however, the higher scores of 5 and 6 in each item indicates normal or unimpaired functioning, and the lower scores of 0 and 1 indicates severe impairment of the function in each item (8). Development of the Persian version of the QLS was conducted in two steps: 1) translating the tool and verifying cross-cultural translation equivalents, and 2) assessing the validity and reliability of the Persian version. To prepare the Persian version of the QLS questionnaire was first translated and then

back-translated, employing the WHO's process of translation of instruments. The initial Persian translation was assessed by a bilingual expert group of mental health professionals consisted of four psychiatrists. After discussions in the group, necessary revisions were made until agreement was achieved on the cross-cultural equivalent of the translation. The back-translation was done by an independent translator without professional knowledge of psychiatry. The back-translation was compared with the original one to recognize the discrepancies. Subsequently, these discrepancies were discussed in the expert group and necessary modifications were made.

For assessing the content validity, qualitative and quantitative methods were implemented for relevancy, clarity, and comprehensiveness of the instrument. In the qualitative step, the experts provided feedbacks on the items for necessary modifications. In the quantitative step, four psychiatrists and six residents of psychiatry rated the instrument. Clarity and relevancy were rated from 1 to 4 (1 = inappropriate, 2 = somewhat appropriate, 3 = appropriate, 4 = quite appropriate). Then content validity ratio (CVR) (20) and content validity index (CVI) (21) were calculated. To determine the inter-rater reliability of the QLS, two independent raters simultaneously assessed 52 patients.

3.1. Statistical Analysis

Data were analyzed using the software package for social sciences (SPSS, version 21). Cronbach's alpha coefficient was used to evaluate the internal consistency of the domains. It was calculated for all items and categories, and values equal to or greater than 0.70 were considered as acceptable. The inter-rater reliability was evaluated using the intra-class correlation (ICC) coefficient (22). Spearman correlation coefficient (23) was used to examine the convergent and discriminant validity of the QLS with the WHOQOL-BREF and the GAF.

3.2. Ethical Considerations

This study was approved by the ethics committee of Tehran University of Medical Sciences (code number 9311286016). All participants provided informed consent after explaining the study purpose, and assuring the confidentiality.

4. Results

A total of 85 patients with schizophrenia (63.5% men) and 75 control subjects (60% men) took part in the study. The response rate was 100%. Mean age (± SD) of the patients and the control groups were 37.8 (± 9.9) years and 37.3 (± 9.6) years, respectively (P = 0.65). Mean (± SD) HDRS scores were 2.54 (± 1.74) and 1 (± 1.65) in the patients and control group, respectively (Table 1).

Table 1. Demographic Characteristics of the Sample (n = 85)

	Control	Patient	P Value
Mean age (y) ± SD	37.25 ± 9.63	37.81± 37.81	0.71
Sex (%)			0. 64
Male	45 (60)	54 (63.5)	
Female	30 (40)	31 (36.5)	
Marital Status (%)			0.001
Married	58 (77.33)	16 (18.82)	
Single	16 (21.33)	60 (70.58)	
Divorce or separated	1 (1.33)	8 (9.41)	
Widow	0	1 (1.17)	
Occupational (%)			0.001
Employed	73 (97.33)	19 (22.3)	
Unemployed	0	41 (48.23)	
Disable	0	4 (4.70)	
Retired	0	3 (3.52)	
Housekeeper	2 (2.66)	18 (21.17)	

4.1. Content and Face Validity

For assessing the content validity, four psychiatrists and six residents of psychiatry rated simultaneously clarity and relevancy all of the items from 1 to 4 (1 = inappropriate, 2 = somewhat appropriate, 3 = appropriate, 4 = quite appropriate). The section of clarity can be considered as the face validity. In addition, in the pilot phase of the study, the face validity of the items was confirmed due to the fact that the patients could understand the items. The total CVI scores of the Persian version of the QLS for clarity and relevance were 0.91 and 0.97, respectively (Table 2). CVR scores are shown in Table 2. IRA for the clarity of the instrument was calculated by the exact same method. The acceptable level (cut-off point) of this index was considered 80% in this study (24). According to the expert numbers in the study that was 10, numerical values of the Lawshe table was 0.62, CVR was not accepted for items number 15 and 18 (20).

4.2. Convergent and Discriminant Validity

In the patients group, QLS scores for each category had a poor correlation with the WHOQOL-BREF dimensions (Table 3). In the patients group, Spearman correlation coefficients between the total score of the QLS and different domains of WHOQOL-BREF were 0.12 in the physical health, 0.03 in the psychological, 0.17 in the social relationships,

Table 2. Content Validity Ratio (Cvr) of The Persian Version of The Qls in Patients With Schizophrenia

	Item	CVR	CVI (Clarity)	CVI (Relevance)
1	Rate intimate relationships with household members	1	0.8	1
2	Rate intimate relationships	1	0.9	1
3	Rate active acquaintances	0.8	0.8	0.9
4	Rate level of social activity	1	0.8	0.9
5	Rate involved social network	0.8	0.9	1
6	Rate social initiatives	0.8	0.8	0.9
7	Rate social withdrawal	0.8	0.9	1
8	Rate socio-sexual relations	1	1	1
9	Rate of extent of occupational role functioning	0.8	0.9	0.9
10	Rate level of accomplishment	1	0.9	1
11	Rate degree of underemployment	1	-	-
12	Rate satisfaction with occupational role functioning	1	1	1
13	Rate sense of purpose	1	0.9	1
14	Rate degree of motivation	1	0.9	1
15	Rate curiosity	0.6	1	1
16	Rate anhedonia	1	1	1
17	Rate time utilization	1	1	1
18	Rate commonplace objects	0.4	1	1
19	Rate commonplace activities	0.8	1	1
20	Rate capacity for empathy	0.8	0.9	1
21	Rate capacity for engagement and emotional interaction with interviewer	0.8	-	-

and 0.11 in the environment. Table 3 shows Spearman correlation coefficients for the scores of the QLS categories and GAF score. The discriminant validity assessment comparing the scores of the patients and the control group showed significant differences in all domains (Table 4).

4.3. Reliability

Cronbach's alphas were provided for all categories of QLS (Table 5). ICC coefficients were examined for 52 participants. Regarding repeatability of the tool, in all items across all four categories, the ICC coefficients were above 0.98 (Table 6).

5. Discussion

The present study examined the psychometric properties of the Persian version of the QLS. The results indicated adequate validity and reliability of the Persian version of the QLS to evaluate quality of life of patients with schizophrenia.

The process of validation of an instrument into another language faces several challenges. It must be understandable for the target audience and the meaning of the text should be clear (semantic equivalence), the method of execution should be acceptable (technical equivalence), and the content of the questions should be appropriate to the target culture (conceptual equivalence) (20). Our study demonstrated acceptable validity of the Persian version of the QLS. The mean scores for general relevance and clarity of the instrument were 0.97 and 0.91, respectively, indicating a high degree of agreement among experts on the relevance and clarity of the tool. The comprehensiveness of the instrument was quite desirable. Two items failed to achieve acceptable CVR scores (item 15 and 18). Item 15 evaluates curiosity. In authors' belief, this might be due to the fact that the participants did not believe that curiosity is component of quality of life. Item 18 assesses common objects. The default is that engaging in everyday activities in the community requires having certain items. It seems that since the initial development of the QLS by Heinrichs et al. (8), the required common objects have gone through drastic evolution and the items do not apply in the current modern life. Nonetheless, due to their acceptable CVI, none of the items were omitted, however, some were slightly modified.

Table 3. Spearman Correlation Coefficient Between the Dimensions of the QLS and WHOQOL-BREF Domains in Patients with Schizophrenia (n = 85)

QLS	WHOQOL-BREF						GAF
	Physical Health	Psychological Health	Social Relationships	Environmental	1st Question	2nd Question	
Interpersonal Relationship							
rho	0.13	0.05	0.06	0.09	0.19	0.24	0.437
P value	0.22	0.60	0.53	0.36	0.07	0.002	< 0.0001
Instrumental Role							
rho	0.07	-0.05	0.28	0.05	0.16	0.05	0.409
P value	0.48	0.60	0.008	0.63	0.13	0.60	< 0.0001
Intrapsychic Foundation							
rho	0.15	0.06	0.10	0.12	0.16	0.11	0.582
P value	0.15	0.54	0.36	0.24	0.12	0.28	< 0.0001
CommonObjects and Activities							
rho	0.02	0.08	0.15	0.16	0.12	0.19	0.588
P value	0.83	0.42	0.14	0.12	0.27	0.07	< 0.0001
Total							
rho	0.12	0.03	0.17	0.11	0.19	0.16	-
P value	0.26	0.77	0.11	0.29	0.07	0.13	

Table 4. Discriminant Validity; Comparisons of the QLS Dimensions Between Patients with Schizophrenia (n = 85) and Control Group (n = 75)

Domain	Mean ± SD	t	df	P Value
Interpersonal Relationship				
Patient	2.12 ± 0.93			
Control	5.02 ± 0.80	20.90	158	< 0.001
Instrumental Role				
Patient	2.28 ± 1.33			
Control	5.49 ± 0.48	19.76	158	< 0.001
Intrapsychic Foundation				
Patient	2.90 ± 1.08			
Control	5.73 ± 0.28	22.05	158	< 0.001
Common Objects and Activities				
Patient	3.89 ± 1.28			
Control	5.73 ± 0.35	12.03	158	< 0.001
Total				
Patient	2.58 ± 0.93			
Control	5.42 ± 0.43	24.36	158	< 0.001

While assessing the quality of life in patients with schizophrenia, one has to bear in mind several important considerations. First, the majority of instruments used are based on the subjective experience of the patient and do not provide objective and reliable results. Second, the severity of psychotic symptoms seems to influence the quality of life. Finally, functioning might have a deep impact on the ratings provided while assessing the

Table 5. Cronbach's Alphas for All Domains of the Persian Version of QLS Categories in Patients with Schizophrenia (n = 85)

Category	Cronbach's Alpha
Interpersonal relation	0.900
Instrumental role	0.43
Intrapsychic foundations	0.95
Common objects and activities	0.86

Table 6. Inter-Rater Reliability of the Persian Version of the QLS Categories in Patients with Schizophrenia (n = 52)

Category	ICC Coefficient	95% Confidence Interval
Interpersonal relations	0.992	0.98 - 0.99
Instrumental role	0.984	0.97 - 0.99
Intrapsychic foundations	0.994	0.99 - 0.99
Common objects and activities	0.994	0.99 - 0.99

quality of life. The necessity of an instrument, which provides disease-specific assessment of quality of life seems inarguable (25). In our study, lack of correlation between the QLS scores and the WHOQOL-BREF across different domains indicated that the QLS measures more objective and disease-specific aspects of quality of life than a generic instrument such as the WHOQOL-BREF.

The convergent validity of the QLS and the subjective WHOQOL-BREF had a poor correlation. It seems the QLS examines some different aspects of quality of life compared to what WHOQOL-BREF evaluates. It could explain the partial convergent validity and discriminant validity between the two scales. It may support the opinion that disease-specific instruments are more suitable for QOL assessment in schizophrenia. The convergent validity of the QLS and GAF was significant. Our results are in line with the results of other studies (15, 26). In another study, a moderate correlation between QLS and Lancashire Quality of Life Profile questionnaire (LQOLP) was reported and are roughly in line with our study (27). The differences in scores of two scales may also be due to the patients' lack of skills in understanding completing the WHOQOL-BREF questionnaire. Another issue that needs to be addressed is that interviewers might underestimate the patients' quality of life, which could be due to the negative assumptions they have towards patients with schizophrenia.

The ICC coefficients showed high and acceptable inter-rater reliability for all items and categories of the QLS. The results were comparable with several studies (15, 28, 29). It was expected that inter-rater method provides higher reliability scores when compared to test-retest method. For instance, Meltzer et al. (28), reported a 0.61 - 0.89 range for the correlation coefficient in four categories of the QLS, which was lower than our study with a corresponding range of 0.96 - 0.99. In our study, two raters performed independent scoring; however, at the end of the interview, they discussed around the patients, which may have brought their opinion closer to each other through the study. Ritsner et al. (29), completed the QLS for 20 patients with schizophrenia two times within 2-week intervals between assessments and the ICC value was 0.89 (P = 0.001). The results are in line with the results of our study.

Different tools have been developed to assess the quality of life, each focusing on different dimensions of life. subjective measures of QOL assess life satisfaction on the whole and within different life domains whereas objective measures of QOL include indicators of living and health conditions, and role functioning (1, 30). The various factors predicting the subjective level of QOL have been reported including depressive symptoms, positive symptoms, drug-induced extrapyramidal symptoms, or total severity of psychopathology (30). Conversely, the severity of negative symptoms or the presence of tardive dyskinesia is associated with a poor objective QOL. Additionally, it has been shown that cognitive dysfunction has a significant impact on objective, but not subjective QOL (30). Due to the fact that patients with schizophrenia were supposed to be unable to evaluate their QOL themselves as a consequence of their cognitive deficits, objective QOL have been often used in many studies (1, 30). According to our findings, the QLS showed a good reliability in patients with schizophrenia. According to Spearman correlation coefficients, the QLS and the WHOQOL-BREF work almost independently and examine different aspects of quality of life. On the other hand, the QLS is a clinical instrument that is based on interview and observation, and can provide more comprehensive information than the WHOQOL-BREF. It can be concluded that both tools do not exactly measure the same construct and this allowed us to evaluate the degree to which patients' perceptions about their quality of life diverge from those of professionals. Difference between observer-rated and self-report instruments has been reported in some studies (28), whereas others have reported contrasting results (31).

5.1. Conclusions

Overall, our study showed that the Persian version of the QLS is a valid and reliable scale for the assessment of quality of life of patients with schizophrenia in clinical settings. It is a simple and easy to administer instrument. The results of our study indicated that the WHOQOL-BREF and the QLS do not exactly measure the same construct. It can be concluded that the QLS provides a more objective assess-

ment of the quality of life among patients with schizophrenia.

5.2. Limitations and Strengths

The study had some strengths and limitations. The WHO guidelines recommendations for translation and adaptation were implemented for translation of the instrument. The study also benefited from the constructive feedback and review of experts during the translation and validation process. However, the severity of symptoms was not assessed by specific tools such as positive and negative syndrome scale (PANSS). Another limitation was that the reliability of the instrument could not be assessed using a test-retest method.

5.3. Future Directions

The concept of quality of life in patients suffering from chronic and severe mental illnesses still faces some ambiguities and researchers need to arrive at a clearer definition of quality of life and its assessment measures. Perhaps studies with bigger sample sizes assessing the severity of symptoms as well as the quality of life could provide a better grasp of this concept.

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Footnotes

Authors' Contribution: Maryam Masoomi, Behrang Shadloo, Saharnaz Nedjat, Vandad Sharifi, and Homayoun Amini contributed sufficiently in the conception and design of the study. Maryam Masoomi and Zahra Bahrami participated in acquisition of data. Maryam Masoomi, Saharnaz Nedjat and Homayoun Amini undertook the statistical analysis. Maryam Masoomi, Behrang Shadloo, Saharnaz Nedjat, Zahra Bahrami, Vandad Sharifi, and Homayoun Amini participated in interpretation of data. Maryam Masoomi and Homayoun Amini prepared the draft. Behrang Shadloo, Saharnaz Nedjat, Zahra Bahrami, and Vandad Sharifi read the draft and contributed sufficiently to revise the draft. All authors read and revised the manuscript critically for important intellectual content. All authors approved the final manuscript.

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References

1. Karow A, Wittmann L, Schottle D, Schafer I, Lambert M. The assessment of quality of life in clinical practice in patients with schizophrenia. *Dialogues Clin Neurosci*. 2014;**16**(2):185–95. [PubMed: 25152657]. [PubMed Central: PMC4140512].
2. Garrido G, Penades R, Barrios M, Aragay N, Ramos I, Valles V, et al. Computer-assisted cognitive remediation therapy in schizophrenia: Durability of the effects and cost-utility analysis. *Psychiatry Res*. 2017;**254**:198–204. doi: 10.1016/j.psychres.2017.04.065. [PubMed: 28463718].
3. Piccinelli M, Gomez Homen F. *Gender differences in the epidemiology of affective disorders and schizophrenia*. World Health Organization; 1997. Available from: http://www.who.int/iris/handle/10665/63505.
4. Abdollahpour I, Nedjat S, Noroozian M, Majdzadeh R. [Performing content validation process in development of questionnaires]. *Iran J Epidem*. 2011;**6**(4):66–74. Persian.
5. Harper A, Power M, Orley J, Herrman H, Schofield H, Murphy B, et al. Development of the World Health Organization WHOQOL-BREF Quality of Life Assessment. *Psychol Med*. 1998;**28**(3):551–8. doi: 10.1017/s0033291798006676.
6. Ware JE, Snow KK, Kosinski M, Gandek B, New England Medical Center Hospital. Health Institute . *SF-36 Health Survey: Manual and Interpretation Guide*. Boston: Health Institute, New England Medical Center; 1993.
7. Brooks R. EuroQol: the current state of play. *Health Policy*. 1996;**37**(1):53–72. doi: 10.1016/0168-8510(96)00822-6.
8. Heinrichs DW, Hanlon TE, Carpenter WJ. The Quality of Life Scale: an instrument for rating the schizophrenic deficit syndrome. *Schizophr Bull*. 1984;**10**(3):388–98. [PubMed: 6474101].
9. Ritsner M, Kurs R, Gibel A, Ratner Y, Endicott J. Validity of an abbreviated quality of life enjoyment and satisfaction questionnaire (Q-LES-Q-18) for schizophrenia, schizoaffective, and mood disorder patients. *Qual Life Res*. 2005;**14**(7):1693–703. [PubMed: 16119181].
10. Naber D. A self-rating to measure subjective effects of neuroleptic drugs, relationships to objective psychopathology, quality of life, compliance and other clinical variables. *Int Clin Psychopharmacol*. 1995;**10 Suppl 3**:133–8. [PubMed: 8866775].
11. Wilkinson G, Hesdon B, Wild D, Cookson R, Farina C, Sharma V, et al. Self-report quality of life measure for people with schizophrenia: the SQLS. *Br J Psychiatry*. 2000;**177**:42–6. [PubMed: 10945087].
12. Masaeli N, Omranifard V, Maracy MR, Kheirabadi GR, Khedri A. Validity, reliability and factor analysis of Persian version of schizophrenia quality of life scale. *J Educ Health Promot*. 2016;**5**:10. doi: 10.4103/2277-9531.184547. [PubMed: 27512702]. [PubMed Central: PMC4959255].
13. Senin T, Franz M, Deuschle M, Bergemann N, Kammerer-Ciernioch J, Lautenschlager M, et al. QLiS-SF: Development of a short form of the quality of life in schizophrenia questionnaire. *BMC Psychiatry*. 2017;**17**(1):149. doi: 10.1186/s12888-017-1307-1. [PubMed: 28449643]. [PubMed Central: PMC5408441].
14. Kusel Y, Laugharne R, Perrington S, McKendrick J, Stephenson D, Stockton-Henderson J, et al. Measurement of quality of life in schizophrenia: a comparison of two scales. *Soc Psychiatry Psychiatr Epidemiol*. 2007;**42**(10):819–23. doi: 10.1007/s00127-007-0249-1. [PubMed: 17762904].
15. Simon-Abbadi S, Guelfi JD, Ginestet D. Psychometric qualities of the French version of the Heinrichs quality of life rating scale. *Eur Psychiatry*. 1999;**14**(7):386–91. [PubMed: 10683623].
16. Gupta N, Mattoo SK, Basu D, Lobana A. Psychometric properties of quality of life (qls) scale : a brief report. *Indian J Psychiatry*. 2000;**42**(4):415–20. [PubMed: 21407980]. [PubMed Central: PMC2962744].

17. Fervaha G, Foussias G, Siddiqui I, Agid O, Remington G. Abbreviated quality of life scales for schizophrenia: comparison and utility of two brief community functioning measures. *Schizophr Res*. 2014;**154**(1-3):89–92. doi: 10.1016/j.schres.2014.02.013. [PubMed: 24630140].
18. Hooijer C, Zitman FG, Griez E, van Tilburg W, Willemse A, Dinkgreve MA. The Hamilton Depression Rating Scale (HDRS); changes in scores as a function of training and version used. *J Affect Disord*. 1991;**22**(1-2):21–9. [PubMed: 1880305].
19. Hall RC. Global assessment of functioning. A modified scale. *Psychosomatics*. 1995;**36**(3):267–75. doi: 10.1016/S0033-3182(95)71666-8. [PubMed: 7638314].
20. Lawshe CH. A Quantitative Approach to Content Validity. *Pers Psychol*. 1975;**28**(4):563–75. doi: 10.1111/j.1744-6570.1975.tb01393.x.
21. Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendations. *Res Nurs Health*. 2006;**29**(5):489–97. doi: 10.1002/nur.20147. [PubMed: 16977646].
22. Koch GG. Intraclass correlation coefficient. *Encyclopedia of statistical sciences*. 2004;**6**.
23. Myers L, Sirois MJ. Spearman correlation coefficients, differences between. *Enc Statistic Sci*. 2004;**12**.
24. Nedjat S, Montazeri A, Holakouie K, Mohammad K, Majdzadeh R. Psychometric properties of the Iranian interview-administered version of the World Health Organization's Quality of Life Questionnaire (WHOQOL-BREF): a population-based study. *BMC Health Serv Res*. 2008;**8**:61. doi: 10.1186/1472-6963-8-61. [PubMed: 18366715]. [PubMed Central: PMC2287168].
25. Girard V, Tinland A, Bonin JP, Olive F, Poule J, Lancon C, et al. Relevance of a subjective quality of life questionnaire for long-term homeless persons with schizophrenia. *BMC Psychiatry*. 2017;**17**(1):72. doi: 10.1186/s12888-017-1227-0. [PubMed: 28212630]. [PubMed Central: PMC5314634].
26. Hosseini SH, Karkhaneh Yousefi M. Quality of Life and GAF in Schizophrenia Correlation Between Quality of Life and Global Functioning in Schizophrenia. *Iran J Psychiatry Behav Sci*. 2011;**5**(2):120–5. [PubMed: 24644456]. [PubMed Central: PMC3939971].
27. Hayhurst KP, Massie JA, Dunn G, Lewis SW, Drake RJ. Validity of subjective versus objective quality of life assessment in people with schizophrenia. *BMC Psychiatry*. 2014;**14**:365. doi: 10.1186/s12888-014-0365-x. [PubMed: 25539658]. [PubMed Central: PMC4300039].
28. Meltzer HY, Burnett S, Bastani B, Ramirez LF. Effects of six months of clozapine treatment on the quality of life of chronic schizophrenic patients. *Hosp Community Psychiatry*. 1990;**41**(8):892–7. [PubMed: 2401480].
29. Ritsner M, Kurs R, Ratner Y, Gibel A. Condensed version of the Quality of Life Scale for schizophrenia for use in outcome studies. *Psychiatry Res*. 2005;**135**(1):65–75. doi: 10.1016/j.psychres.2005.01.007. [PubMed: 15890413].
30. Yamauchi K, Aki H, Tomotake M, Iga J, Numata S, Motoki I, et al. Predictors of subjective and objective quality of life in outpatients with schizophrenia. *Psychiatry Clin Neurosci*. 2008;**62**(4):404–11. doi: 10.1111/j.1440-1819.2008.01818.x. [PubMed: 18778437].
31. Lobana A, Mattoo SK, Basu D, Gupta N. Convergent validity of quality of life interview (qoli) in an Indian setting: preliminary findings. *Indian J Psychiatry*. 2002;**44**(2):118–24. [PubMed: 21206556]. [PubMed Central: PMC2954338].