

## Symptomatic Remission Determines Functional Improvement and Quality of Life in Schizophrenia

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### ABSTRACT

**Introduction:** Schizophrenia is a chronic illness that negatively affects the quality of life and psychosocial functions. Defined criteria to assess remission in schizophrenia are considered to be useful in the long-term follow-up of patients and in discriminating diagnostic factors. This study investigated the quality of life and functionality in schizophrenia patients in symptomatic remission (R-Sch) and not in remission (Non-R-Sch).

**Methods:** Sociodemographic data were collected for 40 R-Sch and 40 Non-R-Sch patients, and the following scales were administered: the Clinical Global Impression-Severity (CGI-S) Scale; Positive and Negative Syndrome Scale (PANSS), World Health Organization Quality of Life Questionnaire-Short Form, Turkish Version (WHOQOL-BREF-

TR), Quality of Life Scale for Schizophrenia Patients (QLS), and Global Assessment of Functioning Scale (GAF).

**Results:** The total and all subscale scores of PANSS and the CGI-S score were significantly lower in the R-Sch group than in the Non-R-Sch group, whereas the GAF scores and all subscales of QLS and WHOQOL-BREF-TR were significantly higher.

**Conclusion:** This study demonstrates that improvement in symptoms in schizophrenia patients improves quality and functionality in all areas of life, suggesting that an improvement in symptoms is the most important determinant of functional recovery in the treatment of schizophrenia.

**Keywords:** Schizophrenia, symptomatic remission, quality of life

### INTRODUCTION

Schizophrenia patients experience disabling symptoms, poor social functioning, and limited benefits from available treatments (1). Depending on the illness severity and treatment strategy, schizophrenia patients may experience problems in areas such as productivity, daily living activities, motivation, communication skills, and social cohesion (2). These symptoms can lead to difficulties in work, education, training, and social experiences (3,4).

Quality of life is an important outcome in the treatment of schizophrenia patients (5). The concept of quality of life not only includes health-related issues but also covers work and environmental conditions that may indirectly affect health (6,7). The components include an individual's physical health status, ability to adapt, psychological status and well-being, social interaction, and economic status (8), in other words, a state consistent with an individual's objectives, expectations, interests, and standards within culture and value systems. Recent advances in pharmacological and psychosocial approaches for schizophrenia have created higher expectations for the outcome of treatment. These developments may lead to long-term improvement in functioning and the quality of life.

The concept of remission in schizophrenia has long been discussed, and it is important because remission is essential for functional improvement in patients (9). There have been several attempts to develop remission criteria. In 2005, symptomatic remission criteria were defined in terms of the Positive and Negative Syndrome Scale (PANSS), which is based on improvements in symptoms (3). The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), specifies five diagnostic criteria for schizophrenia. Eight core symptoms were chosen to reflect these, and symptomatic remission was then considered to be a score of "mild" or less for all of these, maintained for 6 months. This definition is widely accepted and has been used by many clinicians and researchers (10,11,12). In a study on patients with first-episode schizophrenia, it was found that symptomatic remission is strongly associated with better functioning and higher levels of subjective satisfaction with life (13).

However, considering remission in conjunction with functionality, it is known that a reduction in symptoms may not necessarily be reflected in improved well-being (14). Improvement in symptoms may not leave the patient functional and productive and may restore the patient to a good quality of life (15). Researchers have suggested that the concept of remission should take account of functional improvements (16). Such



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a definition of remission has consistently been associated in studies with functional outcomes, but less so with quality of life measures (17,18,19). Therefore, we aimed to investigate functionality and the quality of life in schizophrenia patients with symptomatic remission. In this study, the quality of life and functional levels were compared in schizophrenia patients with and without symptomatic remission to investigate the hypothesis that improvement in the clinical symptoms of patients provides better functioning and a good quality of life.

## METHODS

### Participants

The study included 80 outpatients [40 with symptomatic remission (R-Sch) and 40 without remission (Non-R-Sch)] aged 18–65 years who were referred to the Department of Mental Health and Disease Psychotic Disorders Unit of Gaziantep University School of Medicine Psychiatry Department Psychosis Unit and who were diagnosed with schizophrenia according to DSM-IV. Patients were excluded if they had a psychiatric disorder other than schizophrenia, were substance users (other than of cigarettes), had a chronic medical disease that could affect social functioning, were pregnant, or suffered from moderate or severe mental retardation, epilepsy, or any neurological disease. In total, 147 consecutive schizophrenia patients who attended the unit between December 2009 and April 2010 were assessed, and 40 who met the symptomatic remission criteria were recruited to form the R-Sch group. From the remaining 107 patients, 40 were randomly selected for the control (Non-R-Sch) group. All interviews and psychiatric evaluations and the completion of the scale forms were performed by a single psychiatrist (MHK). The Ethical Committee of Gaziantep University approved this prospective study. Written informed consent was obtained from each patient and a first-degree relative.

### Psychiatric Assessment

Sociodemographic and clinical data were collected for each patient, including the illness duration, disease history and mental status examination. The patient's overall illness severity was rated using the Clinical Global Impression-Severity Scale (CGI-S) (20), and the current levels of psychopathological symptoms were assessed using PANSS (21).

The remission criteria used in this study were a score of  $\leq 3$  in all eight specified items of PANSS, maintained for at least 6 months. The PANSS items were as follows: positive symptoms subscale: delusions, conceptual disorganization, and hallucinatory behavior; negative symptoms subscale: blunted affect, social withdrawal, and lack of spontaneity; and general psychopathology subscale: unusual thought content and mannerisms and posturing.

Three further scales were administered: the Global Assessment of Functioning Scale (GAF), World Health Organization Quality of Life Questionnaire-Short Form, Turkish Version (WHOQOL-BREF-TR), and Quality of Life Scale for Schizophrenia Patients (QLS). GAF uses a single measure and is helpful for monitoring the clinical course of patients. It is a scaling tool that assesses psychological, social, and occupational functioning (22). WHOQOL-BREF-TR is an abbreviated version of WHOQOL-100 and consists of 26 questions that evaluate a person's quality of life and general health, measuring physical, mental, social, and environmental well-being. It is a self-report scale (23). QLS is a 21-item semi-structured interview form that evaluates functionality over the previous month (24). It evaluates interpersonal relationships, occupational and mental capacities, and life activities.

### Statistical Analysis

Statistical analyses were performed using Statistical Package for Social Sciences (SPSS Inc; Chicago, IL, USA) for Windows 15.0. For statistical analysis, the mean and percentages were calculated. Student's t-test was used for normally distributed data, and the Mann-Whitney U test was used for non-normal data. The chi-square test was used to compare rates. Pearson and Spearman correlation analyses were used to evaluate the relationships between variables. A value of  $p < 0.05$  was considered to be statistically significant.

## RESULTS

The sociodemographic characteristics of the R-Sch and Non-R-Sch patients are presented in Table 1, and their clinical characteristics and quality of life scores are presented in Table 2. As expected, the PANSS positive, PANSS negative, PANSS general psychopathology, PANSS total, and CGI-S scores were significantly lower in the R-Sch group than in the Non-R-Sch group ( $p < 0.001$ ). The GAF score was significantly higher in QLS and all subscale scores of WHOQOL-BREF-TR ( $p < 0.001$ ) (Table 2). Although scores for the personal and daily life areas of QLS were higher in males than in females in the R-Sch group ( $p < 0.05$ ), there was no difference between the genders in other subscale scores of QLS and all subscale scores of WHOQOL-BREF-TR ( $p > 0.05$ ).

In the R-Sch group, there were significant negative correlations between the scores of CGI-S, PANSS positive, PANSS negative, PANSS total, and all subscales of QLS. Although there were negative correlations between the scores of CGI-S, PANSS positive, PANSS negative, PANSS total, and all subscales of WHOQOL-BREF-TR, significant negative correlations were observed only between the mental and social subscales of PANSS total and WHOQOL-BREF-TR (Table 3).

In the Non-R-Sch group, there were negative correlations between the scores of CGI-S, all subscales of QLS, and only the physical and mental subscales of WHOQOL-BREF-TR. In addition, there were significant negative correlations between the scores of PANSS total; total quality of life, personal, occupational, and mental subscales of QLS; and physical, mental, and environmental subscales of WHOQOL-BREF-TR. There were no correlations between age and educational status and scores of any subscale of QLS and WHOQOL-BREF-TR. There were positive correlations between QLS and all subscales of WHOQOL-BREF-TR. The correlations between QLS and WHOQOL-BREF-TR are presented in Table 4.

## DISCUSSION

In this study, all subscores for the quality of life scales and GAF scores were significantly higher in the R-Sch group than in the Non-R-Sch group. Schizophrenia patients often have problems in maintaining their occupation or in starting a new occupation because of impairments in cognitive and social functioning (25). A study similar to ours that compared patients in remission with those not in remission reported that schizophrenia patients in remission show better social functioning (26). Several studies have reported that remission is related to a greater subjective life satisfaction (13), whereas others have reported that there is no correlation between symptomatic remission and the quality of life (15). In our study, the occupational status of the R-Sch patients was significantly higher than that of the Non-R-Sch patients ( $p < 0.004$ ). In a study on 93 R-Sch and 150 Non-R-Sch psychotic patients, the R-Sch group showed better functioning in terms of daily living and social activities (19). In addition, the patients in remission had a better level of education and a higher rate of employment.

In epidemiological studies in the general population, people with higher levels of education have been shown to have a higher quality of life (27,28).

**Table 1.** Sociodemographic and clinical characteristics of patients

	R-Sch (mean±SD)	Non-R-Sch (mean±SD)	p
Age	37.5±10.3	34.5±9.3	0.18**
Age at onset	24.5±8.5	23.1±9.5	0.49**
Duration of illness	12.9±7.5	10.9±6.3	0.20**
	<b>(n; %)</b>	<b>(n; %)</b>	
<b>Sex</b>			0.49*
Male	22; 55.0	25; 62.5	
Female	18; 45.0	15; 37.5	
<b>Living style</b>			0.06*
Alone	2; 5.0	0; 0.0	
With father–mother	21; 52.5	31; 77.5	
With his/her own family	15; 37.5	9; 22.5	
With relatives	2; 5.0	0; 0.0	
<b>Marital status</b>			0.56*
Married	11; 27.5	12; 30.0	
Bachelor	21; 52.5	24; 60.0	
Divorced/widow	8; 20.0	4; 10.0	
<b>Employment</b>			0.004*
Working	19; 47.5	7; 17.5	
Not working	21; 52.5	33; 82.5	
<b>Hospitalization</b>			0.33*
Yes	26; 65	30; 75.0	
No	14; 35	10; 25.0	
<b>Smoking (n; %)</b>			0.26*
Smoker	18; 45.0	23; 57.5	
Non-smoker	22; 55.0	17; 42.5	

\*Chi-square test; \*\*Student's t-test. R-Sch: symptomatic remission; Non-R-Sch: not in symptomatic remission

Higher levels of education in schizophrenia patients are associated with better levels of psychopathology (29), and these patients are more adaptable in social activities and have better life satisfaction (30). Low levels of education and income have been reported to have a negative effect on the quality of life (31). In the present study, the average level of education in the R-Sch group was significantly higher than that in the Non-R-Sch group ( $p<0.001$ ).

In the R-Sch group, the quality of life and scores of some subscales of WHOQOL-BREF-TR were significantly higher in males than in females. There are conflicting results regarding the relationship between gender and the quality of life in schizophrenia patients. A study by Huppert et al. (32) reported that the general, financial, and health scores of the subjective quality of life are lower in females, and other studies have supported the quality of life of male patients being higher (33,34). Conversely, other papers have reported that there is no significant relation between the quality of life and gender (35,36).

In this study, there were negative correlations between the scores of CGI-S, PANSS positive, PANSS negative, PANSS total, and all subscales of WHOQOL BREF-TR. Numerous studies in schizophrenic patients have shown a strong relationship between the quality of life and the PANSS general psychopathology subscale, but only a weak correlation was found between the quality of life and positive and negative symptoms (37,38). Some studies have

**Table 2.** Clinical characteristics and quality of life of R-Sch and Non-R-Sch patients

	R-Sch	Non-R-Sch	p
CGI-S (median, min–max)	2.5, 1–5	5, 3–6	<0.001**
GAF (mean±SD)	77.52±8.83	45.37±10.13	0.001*
<b>PANSS</b>			
Positive (median, min–max)	9, 7–16	21, 10–36	<0.001**
Negative (mean±SD)	12.12±3.92	24.92±7.04	0.001*
General psychopathology (mean±SD)	23.35±4.79	42.35±7.7	0.001*
Total (mean±SD)	44.08±12.32	90.48±16.49	0.001*
<b>QLS</b>			
Interpersonal Relations (mean±SD)	31.8±8.13	15.77±4.79	0.001*
Instrumental Role (mean±SD)	13.17±5.89	5±3.75	0.001*
Intrapsychic Foundations (mean±SD)	33.35±4.61	20.8±4.6	0.001*
Common Objects and Activities (median, min–max)	10, 4–12	21, 10–36	<0.001**
Total (mean±SD)	87.95±16.94	47.7±12.77	0.001*
<b>WHOQOL-BREF-TR</b>			
Physical health (mean±SD)	15.62±1.65	13.2±1.62	0.001*
Psychological (mean±SD)	14.23±1.73	11.48±1.3	0.001*
Social relationships (mean±SD)	9.16±3.37	5.5±1.81	0.001*

\*Student's t-test; \*\*Mann–Whitney U test. R-Sch: symptomatic remission; Non-R-Sch: not in symptomatic remission; CGI-S: Clinical Global Impression-Severity Scale; GAF: Global Assessment of Functioning Scale; PANSS: Positive and Negative Syndrome Scale; QLS: Quality of Life Scale for Schizophrenia Patients; WHOQOL-BREF-TR: World Health Organization Quality of Life Questionnaire-Short Form, Turkish Version

reported that both negative and positive symptoms are important factors affecting the quality of life (39,40), whereas others have reported that positive symptoms have minimal or no effect on the quality of life measurements (36,41). A decrease in positive symptoms has been found to be an important factor in enhancing the quality of life (42). Many studies have shown that negative symptoms reduce the quality of life much more than positive symptoms (43,44), and a positive correlation has been found between the severity of negative symptoms and economic dependence on others, deterioration of social relationships, and inability to take pleasure from activities (45).

In the R-Sch group, there were negative correlations between the scores of CGI-S, PANSS positive, PANSS negative, PANSS total, and all subscales of QLS (Table 3). There were positive correlations between the scores of GAF, QLS, and WHOQOL-BREF-TR. The relationship between functionality and the quality of life can be clearly seen from these results. Karadayi et al. (8) have shown a strong correlation between the quality of life and functionality. We determined that the quality of life decreased in the R-Sch group as the disease duration increased. This shows the devastating effects of schizophrenia over a long period. No relationships were found between the age of the patients or age at disease onset and the quality of life (QLS and WHOQOL-BREF-TR). Many studies appear to support our findings (34), although some studies have reported a relationship between the quality of life and age at disease onset (32). In one study, the quality of life of patients with early-onset schizophrenia was lower than that of patients with late-onset schizophrenia (46). In another, it was reported that patients in remission were younger than those not in remission and had experienced a longer disease duration (26).

**Table 3.** Correlation of quality of life subscales and sociodemographic and clinical characteristics of R-Sch patients

		<b>QLS Interpersonal Relations</b>	<b>QLS Instrumental Role</b>	<b>QLS Intrapsychic Foundations</b>	<b>QLS Common Objects and Activities</b>	<b>QLS Total</b>	<b>WHOQOL -BREF Physical health</b>	<b>WHOQOL -BREF Psychological</b>	<b>WHOQOL -BREF Social relationships</b>	<b>WHOQOL -BREF Environment</b>
CGI	r	-0.659	-0.611	-0.642	-0.553	-0.695	-0.496	-0.703	-0.684	-0.541
	p	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
GAF	r	0.747	0.696	0.625	0.534	0.742	0.384	0.506	0.658	0.412
	p	<0.001	<0.001	<0.001	<0.001	<0.001	0.014	0.001	<0.001	0.008
PANSS Positive	r	-0.724	-0.684	-0.549	-0.510	-0.687	-0.489	-0.609	-0.441	-0.340
	p	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	0.004	0.032
PANSS Negative	r	-0.756	-0.560	-0.642	-0.674	-0.751	-0.451	-0.526	-0.517	-0.440
	p	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	0.001	0.005
PANSS General	r	-0.683	-0.491	-0.471	-0.542	-0.608	-0.308	-0.398	-0.408	-0.325
	p	<0.001	0.001	0.002	<0.001	<0.001	0.053	0.011	0.009	0.041
PANSS Total	r	-0.621	-0.383	-0.439	-0.596	-0.543	-0.276	-0.360	-0.326	-0.281
	p	<0.001	0.015	0.005	<0.001	<0.001	0.085	0.023	0.040	0.080
Education	r	0.347	0.351	0.295	0.215	0.322	0.229	0.399	0.523	0.504
	p	0.028	0.027	0.065	0.182	0.043	0.155	0.032	0.001	0.001
Duration of illness	r	-0.171	-0.249	-0.206	-0.086	-0.192	-0.491	-0.342	-0.118	-0.431
	p	0.293	0.121	0.202	0.598	0.236	0.001	0.031	0.470	0.005
Age	r	-0.063	-0.151	-0.070	-0.110	-0.885	-0.268	-0.054	0.016	-0.270
	p	0.700	0.352	0.668	0.499	0.024	0.094	0.741	0.920	0.092
Age of onset	r	0.069	0.030	-0.571	-0.012	0.133	0.103	0.230	0.118	0.048
	p	0.672	0.855	0.092	0.942	0.413	0.526	0.153	0.468	0.767

CGI-S: Clinical Global Impression-Severity Scale; GAF: Global Assessment of Functioning Scale; PANSS: Positive and Negative Syndrome Scale; QLS: Quality of Life Scale for Schizophrenia Patients; WHOQOL-BREF-TR: World Health Organization Quality of Life Questionnaire-Short Form, Turkish Version

**Table 4.** Correlations between QLS and WHOQOL-BREF in whole patients

		<b>QLS Interpersonal Relations</b>	<b>QLS Instrumental Role</b>	<b>QLS Intrapsychic Foundations</b>	<b>QLS Common Objects and Activities</b>	<b>QLS Total</b>
WHOQOL-BREF Physical health	r	0.722	0.690	0.767	0.732	0.786
	p	<0.001	<0.001	<0.001	<0.001	<0.001
WHOQOL-BREF Psychological	r	0.790	0.799	0.862	0.798	0.875
	p	<0.001	<0.001	<0.001	<0.001	<0.001
WHOQOL-BREF Social relationships	r	0.694	0.639	0.673	0.598	0.705
	p	<0.001	<0.001	<0.001	<0.001	<0.001
WHOQOL-BREF Environment	r	0.767	0.694	0.799	0.711	0.790
	p	<0.001	<0.001	<0.001	<0.001	<0.001

QLS: Quality of Life Scale for Schizophrenia Patients; WHOQOL-BREF-TR: World Health Organization Quality of Life Questionnaire-Short Form, Turkish Version

In schizophrenia, the quality of life is subjectively and objectively assessed. In previous studies, some incompatibilities between subjective and objective measurements have been observed (47). Although Harvey et al. (48) suggested that patients' self-reported functional capacities are problematic, self-reporting measures of the quality of life are more acceptable than measures reported by clinicians (49,50). In our study, the strong positive correlation between QLS (completed by physicians) and WHOQOL BREF-TR (completed by patients and their relatives) suggests that these results are consistent in evaluating the quality of life of schizophrenia patients.

CGI-S is completed by physicians and is a scale with a high validity. As expected, we found a positive correlation between the CGI-S scores and the PANSS positive, negative, general psychopathology, and total scores. In addition, a negative correlation was found between the CGI-S and the func-

tionality scale and quality of life scores. This suggests that physicians, when assessing the severity of the disease, not only consider the symptoms but also take account of the functionality and quality of life of patients to some extent. The assessment of this, including the functionality and quality of life measurements during remission, and the development of a new method of assessing remission and new quantitative scales could be topics for future research as it is known that the remission of symptoms cannot always provide well-being in terms of the quality of life, productivity, and social functionality (14).

There are some limitations to our study. In our psychiatric evaluation, we were unable to gather reliable information from the patients or their caregivers or relatives about the duration of their untreated period. A further limitation was that the study was cross-sectional. Due to the small sample size, our results should be interpreted with care.

Although remission in schizophrenia is evaluated only in terms of symptoms, according to this study, improvement in symptoms is important and determines the quality of life and functional recovery of the patient. In this context, the present study showed that symptom control may be the first and most important objective in the treatment of schizophrenia.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the ethics committee of Gaziantep University School of Medicine.

**Informed Consent:** Written informed consent was obtained from patient who participated in this study.

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## REFERENCES

- Tarbox SI, Addington J, Cadenhead KS, Cannon TD, Cornblatt BA, Perkins DO, Seidman LJ, Tsuang MT, Walker EF, Heinsenn R, McGlashan TH, Woods SW. Functional development in clinical high risk youth: Prediction of schizophrenia versus other psychotic disorders. *Psychiatry Res* 2014; 215:52-60. [CrossRef]
- Eren İ, Şimşek D, Çalışkan AM. Şizofreni hastalarında yetiyitimi ve belirti şiddetinin yaşam kalitesine etkisi. *Düşünen Adam: Psikiyatri ve Nörolojik Bilimler Dergisi* 2007; 20:68-78.
- Andreasen NC, Carpenter WT, Kane JM, Lasser RA, Marder SR, Weinberger DR. Remission in schizophrenia: proposed criteria and rationale for consensus. *Am J Psychiatry* 2005; 162:441-449. [CrossRef]
- Fan X, Henderson DC, Nguyen DD, Cather C, Freudenreich O, Evins AE, Borba C, Goff DC. Posttraumatic stress disorder, cognitive function and quality of life in patients with schizophrenia. *Psychiatry Res* 2008; 159:140-146. [CrossRef]
- Priebe S, McCabe R, Junghan U, Kallert T, Ruggeri M, Slade M, Reininghaus U. Association between symptoms and quality of life in patients with schizophrenia: a pooled analysis of changes over time. *Schizophr Res* 2011; 133:17-21. [CrossRef]
- Fitzpatrick R, Fletcher A, Gore S, Jones D, Spiegelhalter D, Cox D. Quality of life measures in health care. I: Applications and issues in assessment. *BMJ* 1992; 305:1074-1077. [CrossRef]
- Keister KJ, Blixen CE. Quality of life and aging. *J Gerontol Nurs* 1998; 24:22-28. [CrossRef]
- Karadayı G, Emiroğlu B, Üçok A. Relationship of symptomatic remission with quality of life and functionality in patients with schizophrenia. *Compr Psychiatry* 2011; 52:701-707. [CrossRef]
- Ciudad A, Álvarez E, Bobes J, San L, Polavieja P, Gilaberte I. Remission in schizophrenia: results from a follow-up 1-year observational study. *Schizophr Res* 2009; 108:214-222. [CrossRef]
- Wobrock T, Köhler J, Klein P, Falkai P. Achieving symptomatic remission in out-patients with schizophrenia—a naturalistic study with quetiapine. *Acta Psychiatr Scand* 2009; 120:120-128. [CrossRef]
- Bankole A, Cohen CI, Vahia I, Diwan S, Palekar N, Reyes P, Sapra M, Ramirez PM. Symptomatic remission in a multiracial urban population of older adults with schizophrenia. *Am J Geriatr Psychiatry* 2008; 16:966-973. [CrossRef]
- Peuskens J, Trivedi JK, Brecher M, Miller F. Study 4 Investigators. Long-term symptomatic remission of schizophrenia with once-daily extended release quetiapine fumarate: post-hoc analysis of data from a randomized withdrawal, placebo-controlled study. *Int Clin Psychopharmacol* 2010; 25:183-187. [CrossRef]
- Bodén R, Sundström J, Lindström E, Lindström L. Association between symptomatic remission and functional outcome in first-episode schizophrenia. *Schizophr Res* 2009; 107:232-237. [CrossRef]
- Bobes J, Ciudad A, Álvarez E, San L, Polavieja P, Gilaberte I. Recovery from schizophrenia: results from a 1-year follow-up observational study of patients in symptomatic remission. *Schizophr Res* 2009; 115:58-66. [CrossRef]
- Wunderink L, Nienhuis FJ, Sytema S, Wiersma D. Predictive validity of proposed remission criteria in first-episode schizophrenic patients responding to antipsychotics. *Schizophr Bull* 2007; 33:792-796. [CrossRef]
- Leucht S, Lasser R. The concepts of remission and recovery in schizophrenia. *Pharmacopsychiatry* 2006; 39:161-170. [CrossRef]
- Lambert M, Schimmelmann BG, Naber D, Schacht A, Karow A, Wagner T, Czekała J. Prediction of remission as a combination of symptomatic and functional remission and adequate subjective well-being in 2960 patients with schizophrenia. *J Clin Psychiatry* 2006; 67:1690-1697. [CrossRef]
- Van Os J, Drukker M, à Campo J, Meijer J, Bak M, Delespaul P. Validation of remission criteria for schizophrenia. *Am J Psychiatry* 2006; 163:2000-2002. [CrossRef]
- Hellidin L, Kane JM, Karilampi U, Norlander T, Archer T. Remission in prognosis of functional outcome: a new dimension in the treatment of patients with psychotic disorders. *Schizophr Res* 2007; 93:160-168. [CrossRef]
- Guy W. Clinical global impression scale. The ECDEU Assessment Manual for Psychopharmacology-Revised 1976; 76:218-222.
- Kay SR, Flszbein A, Opfer LA. The positive and negative syndrome scale (PANSS) for schizophrenia. *Schizophr Bull* 1987; 13:261-276. [CrossRef]
- Endicott J, Spitzer RL, Fleiss JL, Cohen J. The global assessment scale. A procedure for measuring overall severity of psychiatric disturbance. *Arch Gen Psychiatry* 1976; 33:766-771. [CrossRef]
- Eser E, Fidaner H, Fidaner C, Eser SY, Elbi H, Göker, E. WHOQOL-BREF TR: a suitable instrument for the assessment of quality of life for use in the health care settings in Turkey. *Qual Life Res* 1999; 8:647.
- Heinrichs DW, Hanlon TE, Carpenter Jr WT. The quality of life scale. *Schizophr Bull* 1984; 10:388-398. [CrossRef]
- Milev P, Ho BC, Arndt S, Andreasen NC. Predictive values of neurocognition and negative symptoms on functional outcome in schizophrenia: a longitudinal first-episode study with 7-year follow-up. *Am J Psychiatry* 2005; 162:495-506. [CrossRef]
- Brisso S, Dias VV, Balanzá-Martinez V, Carita AI, Figueira ML. Symptomatic remission in schizophrenia patients: relationship with social functioning, quality of life, and neurocognitive performance. *Schizophr Res* 2011; 129:133-136. [CrossRef]
- Bruce ML, Takeuchi DT, Leaf PJ. Poverty and psychiatric status: longitudinal evidence from the New Haven Epidemiologic Catchment Area Study. *Arch Gen Psychiatry* 1991; 48:470-474. [CrossRef]
- Stephens T, Dulberg C, Joubert N. La santé mentale de la population canadienne: une analyse exhaustive. *Maladies Chroniques au Canada* 1999; 20:131-140.
- Huber G, Gross G, Schüttler R. A long-term follow-up study of schizophrenia: psychiatric course of illness and prognosis. *Acta Psychiatr Scand* 1975; 52:49-57. [CrossRef]
- Koivumaa-Honkanen HT, Viinamäki H, Honkanen R, Tanskanen A, Antikainen R, Niskanen L, Jääskeläinen J, Lehtonen J. Correlates of life satisfaction among psychiatric patients. *Acta Psychiatr Scand* 1996; 94:372-378. [CrossRef]
- Cardoso CS, Caiaffa WT, Bandeira M, Siqueira AL, Abreu MNS, Fonseca JOP. Factors associated with low quality of life in schizophrenia. *Cadernos de Saúde Pública* 2005; 21: 1338-1340. [CrossRef]
- Huppert JD, Weiss KA, Lim R, Pratt S, Smith, TE. Quality of life in schizophrenia: contributions of anxiety and depression. *Schizophr Res* 2001; 51:171-180. [CrossRef]

33. McEvoy JP, Meyer JM, Goff DC, Nasrallah HA, Davis SM, Sullivan L. Prevalence of the metabolic syndrome in patients with schizophrenia: baseline results from the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) schizophrenia trial and comparison with national estimates from NHANES III. *Schizophrenia Res* 2005; 80:19-32. [\[CrossRef\]](#)
34. Kugo A, Terada S, Ishizu H, Takeda T, Sato S, Habara, T. Quality of life for patients with schizophrenia in a Japanese psychiatric hospital. *Psychiatry Res* 2006; 144:49-56. [\[CrossRef\]](#)
35. Browne S, Clarke M, Gervin M, Waddington JL, Larkin C, O'Callaghan E. Determinants of quality of life at first presentation with schizophrenia. *Br J Psychiatry* 2000; 176:173-176. [\[CrossRef\]](#)
36. Fitzgerald PB, Williams CL, Corteling N, Folia SL, Brewer K, Adams A, De Castella ARA, Rolfe T, Davey P, Kulkarni J. Subject and observer-rated quality of life in schizophrenia. *Acta Psychiatr Scand* 2001; 103:387-392. [\[CrossRef\]](#)
37. Ritsner M, Kurs R. Quality of life outcomes in mental illness: schizophrenia, mood and anxiety disorders. *Expert Rev Pharmacoecon Outcomes Res* 2003; 3:189-199. [\[CrossRef\]](#)
38. Packer S, Husted J, Cohen S, Tomlinson G. Psychopathology and quality of life in schizophrenia. *J Psychiatry Neurosci* 1997; 22:231-234.
39. Eack SM, Newhill CE. Psychiatric symptoms and quality of life in schizophrenia: a meta-analysis. *Schizophr Bull* 2007; 33:1225-1237. [\[CrossRef\]](#)
40. Thorup A, Petersen L, Jeppesen P, Nordentoft M. The quality of life among first-episode psychotic patients in the opus trial. *Schizophr Res* 2010; 116:27-34. [\[CrossRef\]](#)
41. Narvaez JM, Twamley EW, McKibbin CL, Heaton RK, Patterson TL. Subjective and objective quality of life in schizophrenia. *Schizophr Res* 2008; 98:201-208. [\[CrossRef\]](#)
42. Karow A, Moritz S, Lambert M, Schoder S, Krausz M. PANSS syndromes and quality of life in schizophrenia. *Psychopathology* 2005; 38:320-326. [\[CrossRef\]](#)
43. Galletly CA, Clark CR, McFarlane AC, Weber DL. Relationships between changes in symptom ratings, neuropsychological test performance and quality of life in schizophrenic patients treated with clozapine. *Psychiatry Res* 1997; 72:161-166. [\[CrossRef\]](#)
44. Ruggeri M, Nose M, Bonetto C, Cristofalo D, Lasalvia A, Salvi G, Stefani B, Malchioldi F, Tansella M. Changes and predictors of change in objective and subjective quality of life Multiwave follow-up study in community psychiatric practice. *Br J Psychiatry* 2005; 187:121-130. [\[CrossRef\]](#)
45. Lewis S, Escalona P, Keith S Phenomenology of schizophrenia. Sadock B, Sadock P and Ruiz P, editors. *Kaplan and Sadocks Comprehensive Textbook of Psychiatry* in. 9th edition Philadelphia: Lippincott, Williams & Wilkins;2009. p. 1443-1447.
46. Kao YC, Liu YP, Chou MK, Cheng TH. Subjective quality of life in patients with chronic schizophrenia: relationships between psychosocial and clinical characteristics. *Compr Psychiatry* 2011; 52:171-180. [\[CrossRef\]](#)
47. Jung HY, Hwang SSH, Yi JS, Kim Y, Kim YS. Clinician-rated functioning and patient-rated quality of life in schizophrenia: Implications of their correspondence for psychopathology and side effects. *Prog Neuropsychopharmacol Biol Psychiatry* 2010; 34:225-230. [\[CrossRef\]](#)
48. Harvey PD, Velligan DI, Bellack AS. Performance-based measures of functional skills: usefulness in clinical treatment studies. *Schizophr Bull* 2007; 33:1138-1148. [\[CrossRef\]](#)
49. Becchi A, Rucci P, Placentino A, Neri G, de Girolamo G. Quality of life in patients with schizophrenia-comparison of self-report and proxy assessments. *Soc Psychiatr Epidemiol* 2004; 39:397-401. [\[CrossRef\]](#)
50. Voruganti L, Heslegrave R, Awad AG, Seeman MV. Quality of life measurement in schizophrenia: reconciling the quest for subjectivity with the question of reliability. *Psychol Med* 1998; 28:165-172. [\[CrossRef\]](#)