

## Personal and macro-systemic factors as predictors of quality of life in chronic schizophrenia

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### Abstract

**Background:** The goal of this research was to establish possible predictive factors for both subjective and externally assessed quality of life in people with chronic schizophrenia. **Methods:** Sixty-eight people with schizophrenia took part in the study and were assessed using the World Health Organisation Quality of Life Assessment - Brief Version (WHOQOL-BREF), the Quality of Life Scale (QLS), the Positive and Negative Syndrome Scale for Schizophrenia (PANSS), the Global Assessment of Functioning (GAF), the Social Functioning Scale (SFS) tests. Correlations and multiple regression analysis were conducted to determine possible predictors of quality of life. **Results:** The residential environment (rural/urban), diagnosis, age at onset of disorder, global functioning and social functioning explained 68% of the total variance based on proxies' assessment quality of life. Living arrangements and social functioning emerged as predictor variables for subjective quality of life, explaining a 47.3% of the total variance. **Conclusions:** Socio-cultural factors, such as social integration or the quality of interpersonal relationships, have more influence on these peoples' physical and psychological health than certain personal factors, such as psychopathology. It is therefore advisable to pay attention to the environment and macro-systemic variables when developing intervention plans to improve their quality of life.

**Keywords:** Quality of life, schizophrenia, social functioning, living environment.

### Resumen

**Factores personales y macrosistémicos como predictores de la calidad de vida en esquizofrenia crónica. Antecedentes:** el objetivo de este estudio ha sido la evaluación de los posibles factores predictores de la calidad de vida, tanto subjetiva como evaluada externamente, de las personas con esquizofrenia. **Método:** un total de 68 personas con esquizofrenia participaron en el estudio y fueron evaluadas a través de la WHOQOL-BREF y QLS (calidad de vida), la PANSS (psicopatología), la GAF (funcionamiento global) y la SFS (funcionamiento social). Se realizaron análisis de regresión múltiple mediante el método de pasos sucesivos con el fin de determinar los posibles factores predictores. **Resultados:** el entorno de residencia (rural/urbano), el diagnóstico, la edad de inicio del trastorno, el funcionamiento global y el funcionamiento social explicaron el 68% de la varianza de la calidad de vida evaluada externamente. El tipo de convivencia y el funcionamiento social emergen como variables predictoras de la calidad de vida subjetiva, explicando un 47,3% de la varianza total. **Conclusiones:** factores como la integración social y la calidad de las relaciones interpersonales tienen más influencia en la calidad de vida de estas personas que factores personales como la psicopatología. Los planes de intervención para mejorar su calidad de vida deben incluir estos factores macrosistémicos.

**Palabras clave:** calidad de vida, esquizofrenia, funcionamiento social, entorno de residencia.

Schizophrenia is a severe mental disorder which affects a person's global functioning and causes changes in almost all mental functions. Because of its seriousness, it is one of the mental disorders which leads to most disability, and is amongst the top 20 health causes of serious disability worldwide, both in developed and developing nations (World Health Organization, 2011). Additionally, people with schizophrenia are often stigmatised and discriminated against. Because of this, schizophrenia has often been associated with a notable reduction in quality of life (QoL). The concept of QoL has gained importance in recent decades and has become an unavoidable goal in the current treatment of people

with schizophrenia (Maat, Fett, Derks, & Group Investigators, 2012; Thornicroft et al., 2009). Despite the fact that we do not yet have a consensus on the conceptualization of this construct, the majority of current models include components of wellbeing/satisfaction, performance of roles and contextual factors (Freeman, 2000).

Previous research has attempted to determine the influence of various psychological and social factors on the QoL in this group. Clinical variables have been thoroughly investigated, indicating negative relationships between the presence of positive and negative psychotic symptoms and QoL (Adelufosi, Ogunwale, Abayomi, & Mosanya, 2013; Ueoka et al., 2011). Social functioning has also been identified as an important element, those with better functioning and social support show better QoL (Adelufosi et al., 2013; Chou, Ma, & Yang, 2014).

Research in recent decades has undoubtedly contributed to the advance in the knowledge of the determinants of QoL in schizophrenia. Nevertheless, the results have not been conclusive due to the heterogeneity of study designs, selected characteristics,

the sample examined, and the manner in which QoL has been defined and measured (Alessandrini et al., 2016; Meesters et al., 2013). This lack of consensus does not provide development of clinical interventions and practice-based evidence which could enhance and improve QoL of these people.

Faced with the absence of conclusive results, the aim of this research is to create an approach to the study of predictive factors for QoL in people with schizophrenia from a wide perspective. Based on that evidence: a) a weak influence on QoL by sociodemographics is expected (e.g., Fervaha, Agid, Takeuchi, Foussias, & Remington, 2013); b) a negative relationship between QoL and psychopathology is expected (Akinsulore et al., 2014); however, c) interpersonal relationships are expected to show a larger explanatory power for QoL (e.g. Adelufosi et al., 2013).

To that end, an assessment of the influence of aspects frequently associated with the development of schizophrenia on QoL was made, both self-perceived and as perceived by others. Such aspects include psychopathology, global and social functioning, as well as other types of macro-systemic characteristics, specifically the environment in which the person lives (rural/urban).

### Method

#### Participants

Sixty eight users of the Mental Health Services of the Principality of Asturias (Spain) took part in the study. Participants (male = 48; female = 20) aged between 18 and 65 ( $M = 46.6$ ;  $SD = 11.6$ ), diagnosed with schizophrenia according to criteria ICD-10 (F20), with a minimum of 2 years ( $M = 26.1$ ;  $SD = 9.7$ ) of the disorder and clinically stable at the time of the assessment. Patients were excluded if they had intellectual disability, cerebral damage or existing central nervous system issues, or visual, auditory or communication impairments which would severely impede the assessment process. Table 1 presents the main sociodemographic characteristics of the participants.

#### Instruments

##### Criterion variables

Two measuring instruments were used for the assessment of QoL. The Spanish version of the World Health Organization Quality of Life Assessment - Brief Version (WHOQOL-BREF; World Health Organization, 1996), a self-applied instrument comprised by 6 items which allows the subjective assessment of four domains of QoL: physical health, psychological, social relationships and environment. The reliability coefficient estimated via Chronbach's alpha was .88 (Mas, Amador, Gómez, & Lalucat, 2012).

The Quality of Life Scale (QLS; Heinrichs, Hanlon, & Carpenter, 1984), a semi structured interview which allows the proxy assessment of QoL applying 21 items grouped in 4 categories: intrapsychic foundations, interpersonal relations, instrumental role, and common objects and activities. The reliability coefficient estimated via Cronbach's alpha for the Spanish version was .96 (Rodríguez et al., 1995).

##### Predictor variables

##### Sociodemographic and clinical factors

The following variables were considered: sex, residence (rural/urban), age, living arrangements, civil status, educational

qualifications, work situation, age when the disorder began, diagnosis, number of hospital admissions, and antipsychotic treatment dosage. With respect to this last variable, and given the variability of the type of neuroleptic treatments found, in order to make a comparison, the dosage received by each patient was converted to a dose of Chlorpromazine (Andreasen, Pressler, Nopoulos, Miller, & Ho, 2010).

##### Psychopathology

Psychopathology was measured using the Positive and Negative Syndrome Scale for Schizophrenia (PANSS; Kay, Fiszbein, & Opler, 1987) in its Spanish adaptation (Peralta & Cuesta, 1994). This semistructured interview assesses the presence and severity of positive and negative psychotic symptoms, with a reliability coefficient ( $\alpha$ ) larger than .80.

##### Psychosocial functioning

Psychosocial activity was assessed through the Global Assessment of Functioning (GAF; American Psychiatric Association, 2002), an instrument which assesses general functioning of mental health patients based on a continuum between health and illness. This instrument has shown an inter-rater reliability of .89 (Startup, Jackson, & Bendix, 2002). The Social Functioning Scale (SFS; Birchwood, Smith, Cochrane, Wetton, & Copestake, 1990) was also used, which assesses the fundamental aspects of social functioning for living in the

Table 1  
Demographics and clinical data of the participants

Characteristics	N	M (SD)
<b>Environment</b>		
Rural	25	
Urban	43	
<b>Living arrangements</b>		
Family of origin	42	
Independently from their family of origin	26	
<b>Civil status</b>		
Single	49	
Married	13	
Separated	5	
Widowed	1	
<b>Educational achievement</b>		
None	9	
Primary education	28	
Secondary education	25	
Higher education	6	
<b>Working situation</b>		
Active - Employed	2	
Active - Unemployed	17	
Permanent work disability	44	
Other	5	
<b>Age at onset of disorder</b>		26.10 (9.70)
<b>Diagnosis</b>		
Paranoid schizophrenia	49	
Disorganized schizophrenia	7	
Undifferentiated schizophrenia	1	
Residual schizophrenia	6	
Simple schizophrenia	5	
<b>Hospital admissions</b>		2.87 (2.93)
<b>Dose of chlorpromazine</b>		982.00 (1290.07)

community. It is made up of 79 items which form 7 subscales: social integration/withdrawal, interpersonal communication, social activities, recreation, independence-competence, independence-performance, occupation. Reliability coefficients estimated via Cronbach's alpha for the Spanish version ranged from .69 to .80 (Torres & Olivares, 2005).

*Procedure*

A cross-sectional study was developed within a one year period. The research was reviewed and approved by the Regional Clinical Research Committee of the Principality of Asturias. The principles for conducting research contained in the Declaration of Helsinki were respected. All of the participants were volunteers and signed an informed consent document before their participation in the study.

The assessment was conducted on different days to ensure an adequate level of attention. Three interviews for each participant were conducted with a total duration ranged between two and three hours, to which must be added the time dedicated to self-reports.

Considering that the QLS requires a proxy to complete it, two nurses who were experts in mental health, and who had followed-up the participants for at least five years reported on the QoL of the participants through this instrument.

*Data analysis*

The relationship between QoL and the independent variables was performed through the Pearson Correlation Coefficient, as the variable followed a normal distribution [WHOQOL-BREF ( $z = .553, p = .920$ ); QLS ( $z = .644, p = .801$ )]. Differences between groups were tested by applying nonparametric analysis via the Mann-Whitney test, given that the group were not balanced in terms of number of participants. In addition, stepwise multiple regression analysis was performed in order to obtain explanatory models for each QoL variable (CL = 95%).

**Results**

*QoL and sociodemographic variables*

Participants from urban environments demonstrated a better QoL, as perceived by others, both in general ( $z = -3.56, p \leq .001, \eta^2 = .43$ ), and in the domains of instrumental role ( $z = -3.72, p \leq .001, \eta^2 = -.45$ ), intrapsychic foundations ( $z = -3.89, p \leq .001, \eta^2 = -.47$ ), and common objects and activities ( $z = 4.47, p \leq .001, \eta^2 = -.54$ ).

Whether the subject lives with the family of origin or not is statistically significant related to both measures, both the WHOQOL-BREF ( $z = -2.034, p = .042$ ), and the QLS ( $z = -1.93, p = .050$ ).

The age at which the disorder began is also associated with the QLS at a general level ( $r = .324, p \leq .001$ ) and in the domains of instrumental role ( $r = .485, p \leq .001$ ), intrapsychic foundations ( $r = .284, p = .020$ ), and common objects and activities ( $r = .261, p = .033$ ). Thus, it observed that the older the onset is, the better the QoL is.

*QoL and psychopathology*

The WHOQOL-BREF scale showed no statistically significant relationships with PANSS, apart from the psychological health

subscale which is related to general psychopathology ( $r = -.264, p = .032$ ). In terms of the QLS scale, statistically significant relationships were found between negative psychopathology and global QLS ( $r = -.551, p \leq .001$ ) and domains of interpersonal relations ( $r = -.634, p \leq .001$ ), intrapsychic foundations ( $r = -.473, p \leq .001$ ), and common objects and activities ( $r = -.372, p \leq .001$ ). Statistically significant relationships were also found between general psychopathology and global QLS ( $r = -.390, p \leq .001$ ) and the domains of interpersonal relations ( $r = -.401, p \leq .001$ ), intrapsychic foundations ( $r = -.364, p \leq .001$ ), and common objects and activities ( $r = -.263, p = .040$ ).

*QoL and level of global and social functioning*

The statistically significant relationships between proxy-assessed QoL (QLS) and the subjects' social (SFS) and global (GAF) functioning are shown in Tables 2 and 3.

With respect to self-reported QoL, no significant relationships were found between the WHOQOL-BREF and GAF ( $r = .14, p = .263$ ). A relationship was found, however, between the WHOQOL-BREF and the SFS, in the physical health domain of the WHOQOL-BREF and the overall SFS ( $r = .244, p = .045$ ) and with the domains of social integration/withdrawal ( $r = .485, p \leq .001$ ), interpersonal communication ( $r = .370, p \leq .001$ ), and independence-competence ( $r = .247, p = .042$ ); in the WHOQOL-BREF psychological health domain and SFS social integration/withdrawal ( $r = .457, p \leq .001$ ), and SFS interpersonal ( $r = .421, p \leq .001$ ); WHOQOL-BREF social relationships and overall SFS ( $r = .321, p \leq .001$ ), SFS withdrawal ( $r = .428, p \leq .001$ ), and SFS interpersonal communication ( $r = .421, p \leq .001$ ); and between WHOQOL-BREF environment

*Table 2*  
Correlations between Social Functioning Scale and Quality of Life Scale

	G- QLS	IRe	IR	IF	COA
Overall SFS	.526**	.483**	.431**	.438**	.454**
Social integration/ Withdrawal	.267*	.235	.308*	.220	.122
Interpersonal communication	.415**	.428**	.313**	.352**	.175
Independence- performance	.419**	.341**	.422**	.355**	.384**
Independence- competence	.480**	.384**	.361**	.489**	.417**
Recreation	.299*	.317**	.184	.222	.274*
Social activities	.363**	.326**	.319**	.283*	.369**
Occupation	.216	.348**	-.049	.116	.156

Note: G-QLS: Global QLS; IRe: Interpersonal Relations; IR: Instrumental Role; IF: Intrapsychic Foundations; COA: Common Objects and Activities  
\*  $p < .05$ ; \*\*  $p < .001$

*Table 3*  
Correlations between Global Assessment of Functioning and Quality of Life Scale

	G- QLS	IRe	IR	IF	COA
GAF	.553**	.636**	.256*	.432**	.402**

Note: Note: G-QLS: Global QLS; IRe: Interpersonal Relations; IR: Instrumental Role; IF: Intrapsychic Foundations; COA: Common Objects and Activities  
\*  $p < .05$ ; \*\*  $p < .001$

and overall SFS ( $r = .326, p \leq .001$ ), SFS withdrawal ( $r = .429, p \leq .001$ ), SFS interpersonal communication ( $r = .461, p \leq .001$ ), SFS independence-competence ( $r = .239, p = .049$ ), and SFS social activities ( $r = .276, p = .023$ ).

**Multiple regression**

In order to obtain explanatory models for each QoL subscale, various stepwise multiple regression analyses were carried out, in which the criteria variable was the overall score in the QLS scale and the predictor variables were sociodemographic and clinical variables which had been shown to be significant in the correlation analysis. These variables were introduced as follows: firstly, a regression analysis was performed with the sociodemographic variables (model I), secondly an analysis was performed with clinical variables (model II), thirdly, an analysis was performed with the variables shown to be significant in the previous analyses (model III).

As can be seen in Table 4, the residential environment (rural/urban), diagnosis, age at onset, global functioning and some aspects of social functioning such as interpersonal communication and level of competence at independent living are predictive factors for the QoL for an external observer, accounting for around 68% of the variance.

The same process was followed to examine the relationship between self-perceived QoL (WHOQOL-BREF) and the predictor variables. As Table 5 shows, the type of living arrangements and social functioning in terms of social integration/withdrawal and interpersonal communication are explanatory variables for subjective QoL in this sample accounting for 47.30% of the variance.

Dependent variables	Independent variables	R <sup>2</sup> corrected	β
Overall QLS $F_{7,64} = 22.695; p < .001$	Residence	.681	-.286**
	Residual subtype		-.207*
	Simple subtype		-.260**
	Age at onset		.200*
	GAF		.447**
	SFS Interpersonal communication		.172*
	SFS Independence-competence		.192*
Interpersonal relations $F_{4,65} = 25.018; p < .001$	Paranoid subtype	.596	.254*
	GAF		.539**
	SFS Interpersonal communication		.267*
	SFS Occupation		.209*
Instrumental role $F_{5,66} = 14.722; p < .001$	Residence	.512	.293**
	Age at onset		.323**
	Residual subtype		-.326**
	Simple subtype		-.238*
	SFS Independence-performance		.306*
Intrapsychic foundations $F_{4,65} = 24.489; p < .001$	Residence	.590	.425**
	Paranoid subtype		.342**
	GAF		.230*
	SFS Independence-competence		.320*
Common objects and activities $F_{4,67} = 17.415; p < .001$	Residence	.495	.452**
	Simple subtype		-.198*
	SFS Independence-competence		.335**
	SFS Social activities		.214*

Note: \*  $p < .05$ ; \*\*  $p < .001$

Dependent variables	Independent variables	R <sup>2</sup> corrected	β
Overall WHOQOL $F_{3,67} = 21.065; p < .001$	Living arrangements	.473	-.293*
	SFS Withdrawal		.355*
	SFS Interpersonal		.437**
Physical health $F_{2,67} = 11.362; p < .001$	Living arrangements	.236	-.357*
	SFS Interpersonal		.439**
Psychological health $F_{3,65} = 12.737; p < .001$	SFS Withdrawal	.351	.265*
	SFS Interpersonal		.224*
Social relationships $F_{2,59} = 9.403; p < .001$	SFS Interpersonal	.222	.428**
	Digit Symbol		.241*
Environment $F_{1,67} = 17.774; p < .001$	SFS Interpersonal	.200	.461**

Note: \*  $p < .05$ ; \*\*  $p < .001$

**Discussion**

The results of this research indicate that social or contextual aspects are closely related to QoL in people with schizophrenia, and have a greater influence than other factors such as psychopathology. In terms of proxy-assessed QoL, factors such as type of residence (rural/urban), diagnosis, age at onset, global functioning, and social functioning explain 68% of the variance, while in subjective QoL, living arrangements and social functioning, explain 47.30% of the variance.

In the detailed analysis of the variable we see that, similar to the findings of other authors (Fervaha et al., 2013; Meijer, Koeter, Sprangers, & Schene, 2009), sociodemographic factors have weak or zero influence on QoL, confirming the first hypothesis proposed. However, in this research, two exceptions were found that have been little studied in the literature to date, the environment (rural/urban), and living arrangements.

In terms of the influence of the environment, the results suggest that living in an urban environment is a significant predictor of proxy-assessed QoL, without having any effect on the subjective QoL. This was an unexpected finding. A lower QoL in urban areas was expected, given that living in a rural environment has been related to a less demanding lifestyle with easier adaptation thanks to factors such as social support or the feeling of community help (Navarro, 2003), and to better outcomes (Freeman, 2000), whereas the urban environment has been cited as more hostile, with a higher prevalence of mental disorders (Kovess-Masféty, Alonso, Graaf, & Demyttenaere, 2005). The results of this research seem to indicate that despite the rural environment having these positive aspects, they are not sufficient to mitigate existing deficiencies (e.g. scarceness of public or private resources, isolation, and difficulty of transport), at least from the point of view of the proxies, mental health experts who reported on the participants' QoL.

Living arrangements is a factor which is related to QoL if one considers the fact of living with the family of origin or not. Those participants who live independently from their family of origin demonstrated a lower subjective QoL in terms of their physical

health, but when they are assessed by professionals, they are described as having a better QoL both at the overall level and at the level of the instrument domains. Even though the relationship between living arrangements and the construct of QoL has not been much researched in the literature, there are many studies into the influence of different types of attachment in schizophrenia indicating some (e.g. anxious or avoidance) as predispositional factors for the development of psychotic symptomatology (Gajwani, Patterson, & Birchwood, 2013; Ponizovsky, Vitenberg, Baumgarten-Katz, & Grinshpoon, 2013). The results of this research do not allow us to comment on the impact of the quality of attachment with the family or with a partner when it comes to assessing the QoL of a person with schizophrenia, but they do indicate an area which needs more study.

The second hypothesis established, has been partially confirmed, since psychopathology is a variable which only exerts an influence on externally assessed QoL. The difference found at the age at onset of disorder suggests that a late starting onset may facilitate better life adjustment. Furthermore, although initially negative symptomatology and general psychopathology demonstrated an influence on proxy-assessed QoL, this was diluted when other variables are considered. In other words, while the negative relationship between QoL and psychopathology has been extensively reported (Akinsulore et al., 2014; Fervaha et al., 2013; Savill, Orfanos, Reininghaus, Wykes, Bentall, & Priebe, 2016), this research shows that other variables have better explanatory power.

The most potent factors seen in this study are those most strongly related to interpersonal relationships and social relationships in general, confirming the third hypothesis suggested. Social functioning appears as a predictive factor for QoL both in self and proxy assessment. The people who were assessed as having the better QoL, both by external assessment and self-assessment, were those who are more socially integrated, have more friendships, better communicative competencies and the skills necessary to live their lives autonomously. This is along the same lines as previous studies, which indicate the importance of social functioning (Chino et al., 2009; Galuppi, Turola, Nanni, Mazzoni, & Grassi, 2010; Gutiérrez, Caqueo, Ferrer, & Fernández,

2012; Mantovani, Teixeira, & Salgado, 2015) and perceived social support (Adelufosi et al., 2013) in QoL. In addition, the level of global functioning has also been shown to be an important factor for QoL in this study although in the end it is only as a predictor of proxy-assessed QoL. Based on the results found, the possible reciprocal influence between QoL and social functioning should be examined in further research to identify a possible causal link.

Several limitations should be considered in our study. First, it is a cross-sectional study, which does not allow the establishment of, the previously cited causal links, and second, it was performed with a convenience sample from public mental health service consultants, which could affect the results obtained by possible selection bias. Finally, although the mean number of participants with a diagnosis of a schizophrenia was 62 subjects per research (Guilera et al., 2012), the relatively small sample size ( $N = 68$ ) in comparison with the population of people with schizophrenia prevents more robust conclusions from being drawn.

In light of the results of this research, we may conclude that QoL is a complex construct, made up of various factors which must be assessed both from the view of the person themselves and from an external perspective. While this construct does cover aspects of personal character, the importance of which in QoL has been well documented and which are related to characteristics of schizophrenia (e.g. psychopathology), other aspects have emerged in this study, such as interpersonal relationships and the person in their environment, which must be considered and are essential determinants for QoL. In addition, macro-social variables, which up to now have not excited much research interest, might be significant for the understanding of the QoL construct. Clinicians should bear these variables in mind when establishing and developing intervention programs to improve these people's wellbeing. Future research into QoL and schizophrenia should advocate designs which consider variables at various ecological levels, which specify how the relationships between an individual and their immediate environment affect QoL. It may also be necessary to develop longitudinal studies, with larger, random samples in order to obtain more precise indications of the predictors of change in quality of life.

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