

# Health-Related Quality of Life in Schizophrenia: The Use of SF-36 Direct and Standardized Scores

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## Abstract

**Objectives:** To contribute to the clarification of the relationship between health-related quality of life (HRQOL) in schizophrenia and the sociodemographic and clinical variables, as to detect explanatory variables that allow a better understanding of the quality of life in this complex and fragmentary disorder.

**Method:** Intentional sample by convenience formed by men with schizophrenia. Sociodemographic and clinical information was collected, and the HRQOL was assessed through the SF-36. The relationship between HRQOL and the other variables was based in the SF-36 direct and standardized scores. To assess the relative contribution of variables in the HRQOL, a series of multiple regression analyses were designed and made. The statistical significance level was  $p < 0.05$ .

**Results:** The study sample consisted of 56 men with schizophrenia (54.63±8.29 years). The SF-36 standardized scores allowed a more accurate analysis of the relationship between HRQOL and the studied variables. Data allowed the observation of similar scores to those obtained in the general population after controlling gender and age effects.

**Conclusions:** The variables age, occupation, and BPRS total score presented the largest number of associations with the SF-36 dimensions and emerged as the most relevant predicting variables to the comprehension of HRQOL in schizophrenia.

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**Categories:** Psychiatry, Psychology

**Keywords:** health-related quality of life, sf-36 direct scores, sf-36 standardized scores, schizophrenia

## Introduction

Within psychopathology, schizophrenia is one of the most intriguing disorders to which several authors have been addressing their attention since the 19th century. Described by Morel, in 1850, as a disorder that affects young people in an acute way and evolved the loss of mental abilities is nowadays assumed as a chronic disorder that usually occurs in late adolescence, marked by positive and negative symptoms, and by a cognitive dysfunctioning, especially in working memory, sustained attention, and executive functions [1-2]. It manifests itself in a more precocious way in men between 15-25 years and later in women between 25-35 years, with prevalence rates within 0.5-1.5% according to the American Psychiatric Association [3-4].

Since this is a disorder that significantly affects the life of individuals, the impact this may have on health-related quality of life (HRQOL) has been subject of numerous investigations with the aim to clarify the degree of impairment in schizophrenia. One of the main reasons is due to the social reintegration process started in the 60s-70s of the 20th century in the industrialized countries and that began raise questions as social security, poverty, social isolation, prejudice, general abilities, and impact of treatments on subjects' lives [5]. This trend sensitized the scientific community to the need to enhance the quality of life as an important aspect in the understanding of mental disorders. As a matter of fact, schizophrenia is considered one of the most disabling disorders among the physical and mental manifestations and has been recognized by the World Health Organization as one of the most debilitating disorders in the world, limiting the various domains of a patient's life [6-8].

However, as far as the impact of schizophrenia on HRQOL is concerned, the results are contradictory both in terms of sociodemographic and clinical variables. With respect to sociodemographic features and referring specifically to age, there are studies that suggest a non-association with HRQOL; Brown, Renwick and Nagler [11] defend a quality of life impairment in older schizophrenic patients [9-10]. The same lack of consensus arises as to marital status with some studies suggesting a non-association and other studies defending a better quality of life on married patients [9-10, 12-13]. The same contradictory results arise in qualifications with Souza and Coutinho [5] defending a lack of association, but with Skantze, Malm, Dencker, May, and Corrigan [14] and Rössler, Salize, Cucchiari, Reinhard, and Kernig [15] considering that patients with higher qualification levels had higher impairment on quality of life.

When it comes to clinical variables, Pitta [16] and Lambert and Naber [17] consider that as symptoms decrease in schizophrenia could be crucial to the patients quality of life. However, Corrigan and Buican [9] point to an absence of association between quality of life and a psychiatric symptomatology reduction. When studies focus on positive and negative symptoms and their relationship with quality of life, the absence of consensus continues to occur. Regarding positive symptoms, some studies advocate a negative association with quality of life, whereas other authors did not find associations between variables [9, 11-13,

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18-20]. The same lack of agreement is found when analysing negative symptoms, with studies associating to a worst quality of life and others pointing to a non-association between negative symptoms and quality of life [9-10, 13, 18-22]. In a recent study, Pombares and Campos [23] analysed a sample of 50 schizophrenic men through the Positive and Negative Syndrome Scale - PANSS and the Short-Form 36 Health Survey - SF-36 and concluded that negative symptoms were negatively associated with Vitality (VT); Anergy was negatively associated with the dimensions, Physical Functioning (PF), Physical Role Functioning (RP), and VT; depression was negatively associated with General Health (GH); and patients with positive symptoms predominance revealed a better PF [24-27]. Also, Gonçalves [28] evaluated 39 patients through the SF-36 and concluded that the number of years of hospitalization was positively associated with VT, the number of hospitalizations was associated with GH and occupied patients revealed a better Social Functioning (SF).

It can be concluded that the current state of literature is not unanimous, so it needs to be further explored by the inclusion of new sociodemographic and clinical variables, by the increase in the samples number of patients, and by the use of standardized tests to assess clinical variables and HRQOL. That is, to our knowledge, it was not carried out in any study to assess HRQOL through standardized scores. As the current studies are based on direct scores, there is no control of the gender and age effects, these factors being primordial and distinctive. Nowadays, it is known that as the normal population ages, there is a worsening of quality of life with a focus on the physical dimension [26].

Therefore, the present study intends to contribute to the clarification of the relationship between HRQOL in schizophrenia and the sociodemographic and clinical variables, as to detect explanatory variables that allow a better understanding of the quality of life in this complex and fragmentary disorder.

## Materials And Methods

### Patients

The study sample consisted of inpatient men with the diagnosis of schizophrenia according the American Psychiatric Association [4]. It is an intentional sample by convenience assessed in the first quarter of 2011 in the St. John of God Institute, St. Joseph Health House, in Areias de Vilar (Barcelos - Portugal). Patients were selected with age  $\geq$  18 years and without physical or psychological limitations that would prevent them from filling out questionnaires. Patients with cognitive deterioration in the Mini-Mental State - MMS were excluded from the study [29-30].

### Variables and instruments

#### *Sociodemographic variables:*

Using a researcher-designed form, the following data was collected: (a) numeric variables - age, number of hospitalizations and years of hospitalization; (b) nominal variable - occupation (yes/no); and (c) ordinal variable - studies (1<sup>st</sup> grade - four years of studies / 2<sup>nd</sup> grade - nine years of studies / 3<sup>rd</sup> grade - 12 years of studies).

#### *Clinical variables:*

Psychopathological symptoms were assessed using the Brief Psychiatric Rating Scale [31-32]. It consists of 18 items, scored from 0 to four, with 0 corresponding to *absent* symptom and four corresponding to symptom *present in a severe or extreme way*. Besides the total score obtained by the sum of the 18 items (ranges from 0-72 points), it is possible to obtain the following indices: positive symptoms (*conceptual disorganization, suspiciousness, hallucinatory behavior and unusual thought content*) and negative symptoms (*blunted affect, motor retardation, emotional withdrawal, and disorientation*).

Patients' global functioning (both symptom severity and functional impairment) was assessed with the Global Assessment of Functioning [4, 33]. The scale total score ranges from 0-100, with 100 corresponding to a better condition. As a matter of convenience, the results were clustered into the following ranks: total score  $\leq$  30; between 31-40; and total score  $\geq$  51.

#### *Health-related quality of life:*

The HRQOL was assessed with the generic instrument SF-36, which measures the health perception according to the WHO [26-27]. The SF-36 consists of 36 items divided into two components: the Physical Component and the Mental Component. The final scores of each dimension ranges from 0-100, with the highest score corresponding to a better condition. The physical component includes the following dimensions: Physical Functioning (PF), Physical Role Functioning (RP), Bodily Pain (BP), and General Health (GH). The Mental Component is measured by the following dimensions: Vitality (VT), Mental Health (MH), Social Functioning (SF), and Emotional Role Functioning (RE).

### Procedures

After the informed consent, patients completed the evaluation protocol with the sociodemographic data and the SF-36. The BPRS and GAF were filled out by experts in psychiatry and mental health (psychologists, doctors and nurses).

### Statistical analysis

The statistical analysis was based on observed frequencies (ordinal and nominal variables) and mean and standard deviation (numeric variables). The bivariate relationships between variables were calculated by the *R* Spearman (numeric and ordinal variables) and by the *U* Mann-Whitney (nominal variables). Besides the SF-36 direct scores, the standardized scores were analysed with the aim of controlling age and gender effects, and for that reason, it was used the formula proposed by Ware, Snow, Kosinski and Grandek [34] and the Portuguese normative data: standardized score = (patient score – population mean score) / population standard deviation [26]. Multiple regression analysis was used to assess the relative contribution of sociodemographic and clinical variables as HRQOL predictors. The eight SF-36 dimensions (standardized scores) were the dependent variables (DV), and the sociodemographic and clinical variables related with the scales ( $p < 0.05$ ) were the independent variables (IV). Backward method was used for variable inclusion. The presence of collinearity was assessed by the statistical factor of tolerance and variance inflation (VIF). The statistical significance level was  $p < 0.05$  and the statistical analysis was made using the SPSS version 17.0 for windows.

## Results

The sample studied was formed by 56 inpatient men with schizophrenia with a mean age of  $54.63 \pm 8.29$  years, a mean of  $5.39 \pm 4.97$  hospitalizations and a mean of  $16.36 \pm 11.09$  years of hospitalization. Most patients had first grade studies ( $n=37$ ; 66.1%) and had an occupation ( $n=29$ ; 51.8%) (Table 1). As far as clinical characteristics are concerned, BRPS total scores presented a mean of  $26.75 \pm 10.98$ , with the positive symptoms revealing scores slightly higher than the negative symptoms. When it comes to global functioning (GAF), 19 patients (33.9%) presented scores  $\leq 30$ , and 16 patients (28.6%) presented a better state (scores  $\geq 51$ ) when compared to the other subjects (Table 1).

Sociodemographic variables		Clinical variables	
Age $\pm$ SD (range)	54.63 $\pm$ 8.29 (29-71)	BPRS $\pm$ SD (range)	
No. of hospitalizations $\pm$ SD (range)	5.39 $\pm$ 4.97 (1-20)	Total score	26.75 $\pm$ 10.98 (3-53)
Years of hospitalization $\pm$ SD (range)	16.36 $\pm$ 11.09 (1-37)	Positive symptoms	7.75 $\pm$ 3.72 (1-16)
Occupation N (%)		Negative symptoms	6.21 $\pm$ 2.95 (0-13)
Yes	29 (51.8)		
No	27 (48.2)	GAF N (%)	
Studies N (%)		$\leq 30$	19 (33.9)
1 <sup>st</sup> grade	37 (66.1)	31-40	11 (19.6)
2 <sup>nd</sup> grade	9 (16.1)	41-50	10 (17.9)
3 <sup>rd</sup> grade	10 (17.9)	$\geq 51$	16 (28.6)

**TABLE 1: Sociodemographic and clinical variables**

As to HRQOL, and considering the direct scores of SF-36 dimensions, BP presented the better quality of life scores ( $84.21 \pm 25.24$ ), and GH revealed the lowest scores ( $63.36 \pm 18.45$ ). When the SF-36 standardized scores were taken into account, BP continued to be the dimension with the highest scores ( $0.38 \pm 1.17$ ); however, the most impaired dimension became the PF ( $-0.27 \pm 1.13$ ). It should be mentioned that besides BP, VT ( $0.18 \pm 1.16$ ) also revealed higher scores than those obtained in the general population. The other dimensions, despite presenting negative scores, were close to the scores obtained in the general population (Table 2).

Dimensions	Direct scores	Standardized scores
	±SD (range)	±SD (range)
Physical functioning	79.55±18.61 (40-100)	-0.27±1.13 (-3.60-1.11)
Physical role functioning	76.79±33.99 (0-100)	-0.13±1.17 (-3.96-0.86)
Bodily pain	84.21±25.24 (0-100)	0.38±1.17 (-3.50-1.40)
General health	63.36±18.45 (15-100)	-0.05±0.99 (-2.62-1.82)
Vitality	67.59±22.38 (5-100)	0.18±1.16 (-3.04-1.77)
Social functioning	77.68±28.57 (0-100)	-0.12±1.36 (-3.86-1.14)
Emotional role functioning	73.21±38.83 (0-100)	-0.10±1.11 (-2.25-0.79)
Mental health	68.14±21.11 (24-100)	-0.13±1.10 (-2.73-1.61)

**TABLE 2: Health-related quality of life - SF-36 direct and standardized scores**

By analyzing the relationship between the studied variables and the HRQOL reported through the SF-36 direct scores, it was observed a positive correlation between the BPRS total score and the dimensions BP and RE ( $p < 0.05$ ). Nevertheless, when the SF-36 standardized scores were considered, the number of correlations increased. Patient's age was positively correlated with PF, RP, BP, and MH ( $p < 0.05$ ). In the same way, years of hospitalization was positively correlated with RP, BP, RE, and MH ( $p < 0.05$ ). The BPRS total score was positively correlated with RP, BP and RE ( $p < 0.05$ ). The number of hospitalizations, studies, and positive and negative symptoms from BPRS and GAF, revealed no association with the HRQOL. Similarly, the dimensions, GH and SF, presented no association with the clinical and sociodemographic variables analysed (Table 3).

	Health-related quality of life – SF-36															
	Physical Functioning		Physical Role Functioning		Bodily Pain		General Health		Vitality		Social Functioning		Emotional Role Functioning		Mental Health	
	DS	SS	DS	SS	DS	SS	DS	SS	DS	SS	DS	SS	DS	SS	DS	SS
Sociodemographic variables																
Age	0.094	0.299*	0.122	0.315*	0.099	0.312*	-0.037	0.191	0.055	0.166	-0.42	0.126	-0.169	0.062	0.213	0.291*
N. of hospitalizations	0.003	-0.035	0.059	0.002	0.061	-0.016	0.136	0.093	0.132	0.102	0.078	0.055	0.166	0.145	-0.058	-0.07
Years of hospitalization	-0.109	0.022	0.175	0.283*	0.153	0.290*	0.078	0.204	0.025	0.063	0.165	0.259	0.161	0.315*	0.237	0.281*
Studies	0.222	0.115	-0.086	-0.134	0.092	-0.041	-0.003	-0.11	0.007	-0.036	-0.029	-0.096	-0.039	-0.125	-0.186	-0.222
Clinical variables																
BPRS																
Total score	0.012	0.041	0.256	0.299*	0.285*	0.282*	0.072	0.102	0.087	0.087	0.234	0.254	0.298*	0.329*	0.04	0.06
Positive symptoms	-0.056	-0.065	-0.113	-0.028	0.127	0.078	-0.23	0.033	-0.51	-0.053	-0.095	-0.088	-0.026	-0.063	-0.112	-0.151
Negative symptoms	-0.064	-0.069	-0.032	-0.075	0.201	0.169	0.111	0.079	-0.58	-0.084	0.033	0.038	0.069	0.068	-0.15	-0.099
GAF	-0.069	-0.079	0.062	-0.024	-0.074	-0.101	0.118	0.078	0.125	0.103	-0.108	-0.15	0.066	0	0.164	0.139

**TABLE 3: Relationship between HRQOL and sociodemographic and clinical variables (R Spearman)**

When it comes to occupation, patients with an occupation revealed a better quality of life in the dimensions RP, BP, VT, RE, and MH ( $p < 0.05$ ), and these results were supported both by SF-36 direct and standardized scores (Table 4).

SF-36 (direct scores)															
	Physical Functioning	Physical Role Functioning	Bodily Pain	General Health	Vitality	Social Functioning	Emotional Role Functioning	Mental Health							
	Medium Rank	U	Medium Rank	U	Medium Rank	U	Medium Rank	U	Medium Rank	U	Medium Rank	U	Medium Rank	U	
Occupation															
Yes (N=29)	31.67	299	34.47	218*	32.24	283*	28.38	388	33.98	232*	31.59	302	32.10	287*	34.29
No (N=27)	25.09		22.09		24.48		28.63		22.61		25.19		24.63		22.28
SF-36 (standardized scores)															
	Physical Functioning	Physical Role Functioning	Bodily Pain	General Health	Vitality	Social Functioning	Emotional Role Functioning	Mental Health							
	Medium Rank	U	Medium Rank	U	Medium Rank	U	Medium Rank	U	Medium Rank	U	Medium Rank	U	Medium Rank	U	
Occupation															
Yes (N=29)	31.17	297	34.36	221*	32.24	283*	28.86	381	33.71	240*	31.76	297	33.05	259*	34.26
No (N=27)	25.02		22.20		24.48		28.11		22.91		25.00		23.61		22.31

**TABLE 4: SF-36 dimensions medium rank according to occupation (U Mann-Whitney)**

In order to mark predicting variables on HRQOL, a regression analysis was made using the variables related with the SF-36 dimensions (standardized scores): simple regression in the dimensions PF (IV = age) and VT (IV = occupation); and multiple regression in the dimensions, RP and BP (IV = age, years of hospitalization, BPRS total score and occupation), RE (IV = years of hospitalization, BPRS total score and occupation), and MH (IV = age, years of hospitalization and occupation). As shown in Table 5, age was an important predicting variable for PF and MH, occupation was a predicting variable for RP, BP, VT, RE, and MH, and BPRS total score was a predicting variable for RP, BP and RE. However, according to Abaira and Pérez de Vargas [35], to be an acceptable model, it needs a percentage of explained variance > 25%. This study the proportion of variability ( $R^2$ ) ranges from 0.115 (VT) to 0.243 (RP) so, the present models can't be interpreted in an accurate way. Therefore, the variance in these dimensions may be better explained by other variables that were not considered in this study.

	Predicting variables	R2	F	p	$\beta$	t	p
SF-36							
Physical functioning	Age	0.116	7.058	0.010			
					0.340	2.657	0.010
Physical role functioning		0.243	5.381	0.024			
	Occupation				-0.488	-4.107	0.000
	BPRS total score				0.276	2.320	0.024
Bodily pain		0.193	6.350	0.003			
	Occupation				-0.399	-3.192	0.002
	BRPS total score				0.261	2.085	0.042
Vitality		0.115	7.036	0.010			
	Occupation				-0.340	-2.652	0.010
Emotional role functioning		0.214	8.477	0.001			
	BPRS total score				0.421	3.477	0.001
	Occupation				-0.333	-2.744	0.008
Mental health		0.191	6.250	0.004			
	Occupation				-0.320	-2.580	0.013
	Age				0.268	2.162	0.035

**TABLE 5: Results of the regression analysis for each of the dimensions of the SF-36 standardized scores**

## Discussion

The data reported in this study allows concluding that the HRQOL in schizophrenia is not significantly impaired, with values similar to those obtained in the general population. To support these findings is the use of SF-36 standardized scores, which take into account the gender and age effects, instead of the commons SF-36 direct scores. Occupation, age and BPRS total score presented as the most significant predictors of the HRQOL in schizophrenia; however, the models revealed percentages of explained variance < 25% and should not be interpreted [35].

In this sample, BP is the dimension associated with a better HRQOL either by direct or standardized SF-36 scores (direct scores - 84.21±25.24; standardized scores - 0.58±1.17) which is consistent with those of Pombares and Campos [23] and suggests low levels of pain and limitation associated. On the other hand, and considering the SF-36 direct scores, GH is the most impaired dimension (63.36±18.45). But when the SF-36 standardized scores are analysed, PF becomes the less preserved HRQOL dimension (-0.27±1.13) which suggests an impairment in physical activities perception due to health.

In general, the data presented is similar to the obtained in general population, and it is worth mentioning that BP and VT scores are above the normative data. These findings contradict the literature that supports a high degree of impairment in schizophrenia and that led to the social reintegration process started in the 60's and 70's of the last century [6, 8, 36]. It could be true at the time that schizophrenic inpatients had a worse HRQOL but, nowadays, this perspective needs to be better grounded. With the interventions progress, adoption of rehabilitation strategies, humanization of spaces and increased technical training, it is not linear, at present, that schizophrenic inpatients have a worse quality of life than schizophrenic patients "living" in society.

In order to gain a better understanding of this topic, it is urgent to conduct comparative studies between

these patient groups. Nevertheless, we understand that the real question must take account the appropriate and timely technical support regardless where they live. In fact, our study supports a better HRQOL in patients with more hospitalization years as far as RP, BP, RE, and MH ( $p<0.05$ ) is concerned. These data can be explained by adaptative processes and by the proximity of resources and protective environment. The same goes for age with elderly patients showing a better PF, RP, BP, and MH ( $p<0.05$ ). Gains, with age, emerge especially in the physical dimensions, which are known to be the dimensions that reveal higher impairment with age in the general population and underscores the need of a methodological change in the HRQOL assessment through direct scores since these scores do not take account the influence of important factors, such as age and gender [26].

This data on age contradicts the reports that suggest a lack of association with the HRQOL or even Brown and colleagues [11] which holds an HRQOL impairment in older schizophrenic patients [9-10]. Regarding studies, our data coincides with Souza and Coutinho [5] suggesting a non-association with the quality of life. As to occupation, it is significantly associated with a better HRQOL on the dimensions RP, BP, VT, RE, and MH ( $p<0.05$ ). Developing an activity seems to be a positive contribution for patients' quality of life. For that, occupation may act as a distraction technique, extend the social network and reinforces the social interaction, considered protective factors on mental health.

As far as clinical variables, BPRS total scores are positively correlated with RP, BP and RE ( $p<0.05$ ). These intriguing results associating a psychopathology increase with a better quality of life need to be further explored. Katschinig [37] suggested that the "cure" could be worse than the disease referring to the psychiatric environment and the pharmacological treatment of schizophrenia. According to the author, there are patients that prefer living with hallucinations than to suffer the secondary effects of medication which are not only undesirable but also visible and socially stigmatizing. However, in this study, positive and negative symptoms reveal no associations with HRQOL. For a better understanding of this data, it would be necessary to control the use and medication doses.

The multivariate analysis reinforces the role of occupation, age and BPRS total score as predicting variables of HRQOL in schizophrenia; however, the presenting models revealed proportions of variability less than 25% which prevents its interpretation. Thus, in future studies it would be appropriate to include a large number of sociodemographic, clinical and psychological variables, such as social support and coping strategies.

However, while considering this data, the limitations of the study should be taken into account. The sample has a limited number of 56 patients, and all of them are men. For this reason, future studies should include larger populations, females and different variables. Moreover, the sample consists of patients with long-term hospitalizations; therefore, results should be analysed with caution and should not be generalized to the schizophrenic population. So, for a better understanding of institutionalization effect on HRQOL of patients with schizophrenia, future studies should be multicentric and include patients living in the community.

## Conclusions

N/A

## Additional Information

### Disclosures

**Human subjects:** Consent was obtained by all participants in this study. The Committee from Casa de Saúde S. José issued approval # SRP-112 (10/01/2011). **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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