BASIC SYMPTOMS IN STABLE SCHIZOPHRENIA: RELATIONS WITH FUNCTIONING AND QUALITY OF LIFE

Paola Rocca, Laura Pulvirenti, Cristiana Montemagni, Roberta Rasetti, Giuseppe Rocca, Filippo Bogetto

Abstract

Objective: Over the past few decades it has been emphasized the importance of social functioning and quality of life as a part of a multidimensional assessment of outcome in the evaluation of the impact of psychosis on patients' daily lives. Their relation with schizophrenia symptoms has widely been studied, showing contrasting results. Little is known concerning their relationship with subjective experiences in schizophrenia.

Method: One hundred and eighteen consecutive outpatients affected by schizophrenia in stable phase of illness were recruited for the study. Clinical scales were used to assess objective (Positive and Negative Syndrome Scale: PANSS, Calgary Depression Scale for Schizophrenia: CDSS) and subjective symptoms (Questionario dei Sintomi-Base: FBF), global functioning and quality of life (Global Assessment of Functioning: GAF, Quality Of Life scale: QLS).

Results: After iterative stepwise entries, the combination of three predictor variables (PANSS-positive symptoms subscale, PANSS-negative symptoms subscale, FBF) provided the best-fit GAF model for the data. The combination of two predictor variables (PANSS-negative symptoms subscale, FBF) provided the best-fit QLS- *Intrapsychic Foundations* subscale model for the data.

Conclusions: Our study contributes to underline the necessity to include subjective experiences among the clinical features of schizophrenic patients that must be object of attention. Even if unrelated with objective symptoms assessed by PANSS, they showed a significant correlation with functional outcome and quality of life.

Key Words: basic symptoms, schizophrenia, FBF, quality of life, GAF

Declaration of interest: none

Paola Rocca[a], Laura Pulvirenti[a], Cristiana Montemagni[a], Roberta Rasetti[a], Giuseppe Rocca [b], Filippo Bogetto[a]
[a] Department of Neuroscience, Section of Psychiatry, University of Turin
[b] Department of Neuroscience, University of Turin

Corresponding author
Paola Rocca
Department of Neuroscience, Section of Psychiatry, University of Turin
via Cherasco 11, 10126 Turin, Italy. Ph. 0039-011-6634848, fax 0039-011-673473,
e-mail: paola.rocca@unito.it

Introduction

Over the past few decades social functioning has become increasingly used as a part of a multi-dimensional assessment of outcome in the evaluation of the impact of psychosis on patients' daily lives (Wegener et al. 2005). Despite the recent widespread use of the term social functioning there is a limited consensus concerning its definition. The boundary between psychosocial functioning and quality of life (QOL) as outcome measures is also contested.

Psychosocial functioning represents the capacity of a person to function in different societal roles and their actual social performances, including aspects such as the ability to carry out activities of daily living, the amount or level of work or school functioning, or the type and quality of social support that the patient has. Although no universal definition exists, QOL is usually considered a multidimensional construct that includes subjective well-being and objective mental and physical functioning indicators (Narvaez et al. 2008). World Health Organization defines QOL as "the individual perceptions of their position in life in the context of the culture and value systems in which they life, and in relation to their goals, expectations, standards and concern".

Functional outcome in schizophrenia can be affected by a number of factors like age, gender, education, illness duration, cognitive dysfunctions, symptoms, and pharmacological and psychosocial treatments (Hofer et al. 2005, Wittorf et al. 2008). The factors identified are not always consistent across studies but cognitive dysfunctions and negative symptoms emerged as the most reliable (Bromet et al. 2005, Grant and Beck 2008, Green 1996, Milev et al. 2005). Whereas some studies showed a strong

Submitted January 2010, Accepted March 2010

© 2010 Giovanni Fioriti Editore s.r.l.

independent association between cognition and social functioning, the role of negative symptoms on social functioning is contentious (Green 1996; McGurk et al. 2000a, 2000b; Velligan et al. 2000).

Regarding the factors that influence QOL in schizophrenic patients, although many other influential predictors have been identified, the majority of authors primarily focused on psychiatric symptoms (Eack and Newhill 2007). Indeed, one factor that has been shown to be consistently negatively associated with QOL was psychopathology (Lambert and Naber 2004). QOL has been negatively correlated with positive, negative, general psychopathology, and depressive symptoms, with some studies finding a large relationship among these measures (Fitzgerald et al. 2001, Norman et al. 2000, Rocca et al. 2005) and others indentifying a small to moderate relationship (Ritsner et al. 2005, Sim et al. 2004). Finally, a number of studies failed to find a correlation between QOL and psychiatric symptoms in schizophrenia (Barry 1997, Kaiser and Priebe 1998, Malla et al. 2001, Ritsner et al. 2006).

Subjective experiences have long been a neglected area in schizophrenia research. Recently, there has been a renewed interest in the study of this subject, and several authors underlined their relevance in schizophrenia's clinical picture (Nelson et al. 2008, Sass and Parnas 2003, Uhlas and Mishara 2007).

The definition "Basic Symptoms" (BS) groups a set of symptoms, first described by Huber and colleagues (Huber 1957, 1979; Klosterkötter 1988), which gather the subtle, not yet psychotic disturbances which occur to schizophrenic patients during the course of the disease, and may also precede full clinical onset. These disturbances, which are thought to constitute a phenomenological characteristic close to the disease's *core*, are subjectively experienced subclinical disturbances in drive, affect, thinking, speech, (body) perception, motor action, central vegetative functions, and stress tolerance (Gross 1997, Huber and Gross 1995). They constitute a specific dimension that would be distinct of the classical, negative, positive and neuropsychological symptoms of schizophrenia (Klosterkötter 1992, Pallanti et al. 1999).

Subjective experience has been extensively studied in relation to objective symptoms in schizophrenia, finding different and sometimes contrasting results. Correlations of some of the symptoms grouped among BS were found with positive symptoms (Jaeger et al. 1990, Peralta et al. 1992, Yon and Loas 2000), with negative symptoms (Pallanti et al. 1999, Stanghellini et al. 1991), with both positive and negative symptoms (Mass et al. 2000). Yon et al. (2005) performed a factorial analysis, which found a group of subjective experiences related to positive symptoms, and another one relatively independent from behavioral symptomatology. Moreover, a correlation of depressive symptoms with BS can be found in literature (Liddle et al. 1993, Maggini and Raballo 2006, Rösler et al. 1985).

However, no studies focussed on the role of BS on functional outcome in schizophrenia. Indeed, in clinical practice, the most important feature of BS is that these experiences are spontaneously and immediately recognized and reported as abnormal and burdensome by the patients themselves as disturbances of his/her own (mental) processes. Insight that something is wrong with one's thinking is present, yet some experiences might be so new and strange that they remain nearly inexplicable.

The current study

The purpose of this study was to investigate the importance of BS in the context of global functioning and QOL of the patients, a subject not deeply analyzed to date, to better understand the overall role of this important source of patient's disability. This is an important issue for two reasons. First, treatment outcome and long-term course studies commonly used psychosocial variables as indicators of change in schizophrenia. Thus, exploration of the relationships between psychosocial functioning and subjective experiences would increase our ability to identify and understand potentially important aspects of the disorder. Second, the dearth of studies in this area suggests the importance of attempts to develop models for defining and understand subjective experience in schizophrenia.

To the best of our knowledge, we are the first to report on this issue in a sample of outpatients with stable schizophrenia. In this study, social functioning and QOL were chosen as psychosocial functioning indicators. QOL was assessed with the Quality of life Scale, QLS (Heinrichs et al. 1984), designed specifically for patients with schizophrenia. It is a semistructured, clinician-rated interview that evaluates QOL's four domains: interpersonal relations and social network, instrumental role functioning, intrapsychic foundations and common objects and activities. Many authors suggested that QOL's subjective evaluation is more problematic than an objective assessment, uncontamined by mood states, cognitive disturbances, lack of insight and disorganized thinking.

Moreover, for the purpose of our study, we chose to use the Global Assessment of Functioning (GAF), which comprises from the axis V of the DSM IV, as a measure of the global functioning of patients in the spheres of psychological, social and occupational functioning. This scale was chosen because it is internationally recognized and of practical use in standard clinical trials. It is also considered a reliable and fast measure of disturbance in functioning, which can be readily used by multidisciplinary raters, without the need for extensive training (Jones et al. 1995).

Finally, among the scales published for BS measurement, we used the Frankfurt Complaint Questionnaire, FCQ (Süllwold 1986), developed from the spontaneous complaints of a group of schizophrenic patients. The Italian translation of the FCQ (Stanghellini et al. 1991) was used to evaluate BS. The FCQ is a measure for self-evaluation of subjective disturbing experiences of cognitive impairment. Even though the use of this instrument has been initially restricted to a large extent to German-speaking countries, quite recently several papers using FCQ translations have appeared in English literature (Cuesta et al. 1996; Loas et al. 2002; Pallanti et al. 1997, 1999; Peralta and Cuesta 1992; Stanghellini et al. 1991). Though the FCQ items are grouped into ten categories according to phenomenological similarities, initial factorial analyses suggested four underlying factors interpreted as 1)

disturbances of automated responses; 2) perceptual disturbances; 3) depression; 4) overinclusion (Schunemann-Wurmthaler 1984, Süllwold 1986). Two factors solutions have also been published (Mass et al. 1997). However, unidimensional psychometric properties of FCQ have been confirmed (Cuesta et al. 1996, Rey 1982); moreover, as Yon et al. (2008) recently underlined, several validation studies of the FCQ in schizophrenic samples using principal components analyses (PCA) showed a one-factor solution.

Our working hypothesis was that BS would predict social functioning and QOL, as they are clearly recognized as subjectively burdensome symptoms.

Methods

Patient population

Patients were referred to the Psychiatric Section, Department of Neuroscience, University of Turin, and the Mental Health Department 1 South of Turin in the period between january 1st 2003 to december 31st 2004. Patients were initially evaluated by a clinician-psychiatrist, and if they met DSM-IV-TR (APA, 2000) criteria for schizophrenia, they were seen subsequently by our research team (C.M., L.P.). Of these, a sample of consecutive subjects fulfilling the following criteria were included in the study:

1. men and women in the 18-65 years age group;
2. diagnosis of schizophrenia according to the DSM-IV-TR, confirmed by two expert clinicians (C.M., L.P.) using the Structured Clinical Interview for DSM-IV disorders (SCID) (First et al. 1997). The two psychiatrists (C.M., M.G.) were aware of previous diagnosis and they could also review the previous clinical charts, available for all the patients. Subjects were excluded if they had a current disorder other than schizophrenia on Axis I of the DSM-IV-TR, a current or past codiagnosis of autistic disorder or another pervasive developmental disorder, a history of severe head injury (coma duration greater than or equal to 48 hours) and a diagnosis of organic disorder (especially neurological);
3. patients with stable schizophrenia. Schizophrenia was considered in stable phase if patients had not had any increase in symptomatology during the past year and if they had their antipsychotic regimen unchanged for the last six months (based on chart review). The choice of antipsychotic drug prescribed and dosage were left to the discretion of the treating physicians, which happened well before the initiation of the study.

One-hundred and eighteen consecutive outpatients who met the inclusion criteria were enrolled in the study. Patients were evaluated using a semistructured interview to assess demographic features. Data were collected to determine age, gender, education, age at onset of schizophrenia (report of first contact with a psychiatric service) and antipsychotic treatment. All the patients were receiving antipsychotic medication at time of assessment. For each patient the dose equivalent to 100 mg/day of chlorpromazine was calculated (Woods 2003).

Written informed consent was obtained from all subjects after a complete description of the study. The study was carried out in accordance with Declaration of Helsinki 1995 (as revised in Edinburgh 2000).

Psychiatric assessment

Current levels of psychopathological symptoms were assessed using the Positive and Negative Syndrome Scale, PANSS (Kay et al. 1987), which includes Positive Symptom, Negative Symptom, and General Psychopathology subscales.

Depressive symptoms were evaluated using the Calgary Depression Scale for Schizophrenia, CDSS (Addington et al. 1990), specifically developed to distinguish depressive symptoms in schizophrenia rather than negative symptoms or antipsychotic-induced side effects.

The GAF scale is a clinician-rated, 100-point, single-rating scale, where 1 represents the hypothetically sickest individual and 100 represents the healthiest. The scale is divided into 10 equal parts and provides defining characteristics for each 10-point interval. The GAF evaluates functioning across three domains (psychological, social functioning and occupational/educational functioning) on a hypothetical continuum of mental health-illness. For the purpose of our study, raters were instructed to use the GAF to measure only psychosocial functioning in the month before rating, as reported in other studies (Altshuler et al. 2002; Martinez-Aran et al. 2004, 2007).

The patients' quality of life was evaluated with Heinrichs-Carpenter's Quality of Life Scale (QLS) (Heinrichs et al. 1984), designed specifically for patients with schizophrenia. It is a semi-structured, clinician rated interview using descriptive anchors provided for each question that includes 21 items rated by the clinician on 7-points scales in four domains: interpersonal relations and social network, IRSN (household member, friends, acquaintances, social activity, social network, social initiatives, social withdrawal, sociosexual relations); instrumental role functioning, IRF (extent, adequacy, underemployment, satisfaction); intrapsychic foundations, IF (sense of purpose, motivation, curiosity, anhedonia, time utilization, empathy, interaction); common objects and activities, COA (objects, activities). It takes about 45 minutes giving a global score and scores in each of the four domains. Each item is based on a 7-point scale. The specific descriptors vary among items, but the high end of the scales (scores of 5 and 6) reflects normal or impaired functioning, and the low end of the scales (scores of 0 or 1) reflects severe impairment of the function in question. The ratings are based upon patients' self-report and observers' judgment about patients' functioning and life circumstances. The reliability and validity of the scale have been verified (Heinrichs et al. 1984, 2001).

All assessments (SCID and psychopathological rating scales) were performed by two expert clinicians (C.M., L.P.). In an attempt to reduce inter-rater variability, all raters were trained to administer the psychometric tools according to common standards. Also prior to the commencement of the present study,

they participated in two pilot studies in order to reach a consensus on ratings that were obtained using psychometric scales. In the first one, we conducted rater training under rather naturalistic clinical conditions using videotaped, semi-structured PANSS interviews of schizophrenic patients until all participants were trained during five standardized sessions. The inter-rater reliability was .87-.91 for the positive, .83-.87 for the negative and .88-.92 for the general psychopathology subscales. The procedure for the second pilot study involved the authors completing independent ratings of interviews that were conducted with fifteen patients. Subsequently the study group fixed consensus rating by unsigned votes, and had a detailed discussion about each patient in order to improve the rating skill with strict adherence to the manual instructions. In this study, the agreement-within one point-between the raters varied from 85% to 89% of the time for all items on CDSS and was 91% of the time for QLS total score. In the present study efforts were made to maintain inter-rater reliability across the entire study period, including careful calibration and standardization procedures and regular, in-depth review of a sample of interviews with the lead author.

Clinical assessment was carried out in two sessions, the first for the administration of SCID and the second for the administration and scoring of other clinical scales.

Basic symptoms measurement

BS were assessed with the Italian version (Stanghellini et al. 1991) FCQ, named FBF, developed by Süllwold from the spontaneous complaints of a large group of schizophrenic patients (Süllwold 1986).

FBF is a self-report questionnaire, consisting of 98 yes-no questions concerning the experience of subjective, not yet psychotic symptoms. Questions are divided in 10 subscales (loss of control, simple perception, complex perception, language, thought, memory, motility, lack of automatism, anhedonia-anxiety, sensory overstimulation). For the evaluation, each affirmatively answered item is ascribed to one of the 10 phenomenological subscales; a total score is also calculated. To avoid an exceedingly large number of variables, we chose to consider in our study the whole subjective experience of deficit as measured by FBF as a single factor; for this reason, only FBF total score was taken into account, and not the scores of the ten sub-scales.

In accordance with the guidelines for the questionnaire, FBF was presented by one of the two clinicians, the specific purpose of the questionnaire was explained to the patient, and eventual difficulties in the understanding of the questions were explained.

Statistical analysis

Gender influence and diagnostic schizophrenia types' differences were investigated with One-Way ANOVA.

Linear regressions were performed to analyze how FBF scores are related to age, education, duration of illness, and to scores obtained in other psychopathological dimensions scales (CDSS, GAF, QLS and PANSS sub-scales).

Exploratory univariate linear regressions were performed for QLS scores and GAF with any clinical variable assessed (PANSS scores, CDSS score, FBF scores). All clinical variables that were significantly associated with QLS scores and GAF in the univariate analyses at $p < .01$ (except when we found a single or no predictor for a QLS score) were subsequently analyzed using a multiple stepwise regression with backward elimination to assess the independent contribution of each of the selected predictors on GAF and QLS subscales. A stepwise approach with backward elimination began by including all explanatory variables in the model. Variables were dropped one at a time and the equation was assessed at each step. The procedure was repeated until a satisfactory model was achieved. The process was continued until all the remaining variables had $p < .05$. To get rid of the association between QLS and GAF scores and demographic variables that were correlated with them, they were also included into the regression models. Otherwise, for the specific purpose of our study, only the key relations between sets of predictors including FBF and QLS indices and GAF were analysed.

All statistical analyses were performed using the software system Statistical Package for the Social Sciences, SPSS, version 11.5 for Windows (SPSS Inc, Chicago, Ill).

Results

Patients sample was constituted by 118 subjects; 68 (57.6%) were males and 50 (42.4%) were females. Mean age (±S.D.) was 39.9 (±10.1) years, mean education (±S.D.) measured in years of formal secondary and tertiary schooling, was of 11 (±3.24) years.

The mean average duration of illness (±S.D.) was 14.5 (±9.82) years. Patients had a DSM IV-TR diagnosis of schizophrenia paranoid type (74), disorganized type (27), catatonic type (9), residual type (8). All patients received, at the moment of the study, an antipsychotic farmacotherapy: 40 subjects (34%) were treated with neuroleptics, 78 (66%) were under atypical antipsychotics.

Patients' population showed a moderate severity of illness assessed by clinical scales, as showed in **Table 1**.

One-way ANOVA analysis demonstrated the absence of significant differences between males and females concerning FBF score (males, mean±S.D.: 33.2±21.1; females, mean±S.D.: 31.1±21.3; F=.257; p=.613). No differences among the diagnostic groups were detected concerning FBF total score (ANOVA: F=.430, p=.787), GAF (ANOVA: F=2.177, p=.076), QLS total score (ANOVA: F=2.114, p=.084), QLS-IRSN (ANOVA: F=1.301, p=.274), QLS-IRF (ANOVA: F=2.107, p=.091), QLS-IF (ANOVA: F=2.239, p=.061), QLS-COA (ANOVA: F=1.332, p=.262).

In **Table 2**, results of linear regressions of FBF with other variables object of study are shown. Among demographic characteristics, none of them demon-

Table 1. *Sociodemographic and clinical characteristics of the sample*

Age, years, mean (±SD)	39.9 (±10.1)
Education, years, mean (±SD)	11.0 (±3.24)
Duration of illness, years, mean (±SD)	14.5 (±9.82)
PANNS-P, mean (±SD)	13.8 (±6.07)
PANNS-N, mean (±SD)	18.8 (±8.90)
PANNS-G, mean (±SD)	35.4 (±12.9)
QLS-IRSN, mean (±SD)	23.7 (±10.4)
QLS-IRF, mean (±SD)	10.4 (±6.81)
QLS-IF, mean (±SD)	24.2 (±8.54)
QLS-COA, mean (±SD)	8.18 (±2.32)
CDSS, mean (±SD)	4.63 (±4.31)
GAF, mean (±SD)	56.7 (±13.7)
FBF, mean (±SD)	32.4 (±21.2)

PANSS-P: Positive and Negative Syndrome Scale, Positive Symptoms; PANSS-N: Positive and Negative Syndrome Scale, Negative Symptoms; PANSS-G: Positive and Negative Syndrome Scale, General Psychopathology; QLS-IRSN: Quality of Life Scale, Interpersonal relations and social network; QLS-IRF: Quality of Life Scale, Instrumental role functioning; QLS-IF: Quality of Life Scale, Intrapsychic foundations; QLS-COA: Quality of Life Scale, Common object and activities; CDSS: Calgary Depression Scale for Schizophrenia; GAF: Global Assessment of Functioning; FBF: Questionario dei Sintomi-Base.

Table 2. *Linear regressions between demographic and clinical variables and FBF*

	Standardized β	**Standard error**	**p**
Age	-.121	.193	.191
Duration of illness	-.103	.199	.267
Education	-.136	.187	.167
PANSS-P	.133	.026	.151
PANSS-N	.085	.039	.362
PANSS-G	.134	.056	.149
QLS-IRSN	-.097	.046	.294
QLS-IRF	.008	.030	.933
QLS-IF	-.205	.037	.026
QLS-COA	-.131	.010	.158
CDSS	.334	.017	.000
GAF	-.221	.059	.016

FBF: Questionario dei Sintomi-Base; PANSS-P: Positive and Negative Syndrome Scale, Positive Symptoms; PANSS-N: Positive and Negative Syndrome Scale, Negative Symptoms; PANSS-G: Positive and Negative Syndrome Scale, General Psychopathology; QLS-IRSN: Quality of Life Scale, Interpersonal relations and social network; QLS-IRF: Quality of Life Scale, Instrumental role functioning; QLS-IF: Quality of Life Scale, Intrapsychic foundations; QLS-COA: Quality of Life Scale, Common object and activities; CDSS: Calgary Depression Scale for Schizophrenia; GAF: Global Assessment of Functioning.

strated a significant correlation with FBF score. None of the objective symptomatology clusters measured by PANSS, i.e. positive symptoms, negative symptoms and general psychopathology, showed a significant relation with FBF score. Conversely, the objective symptoms cluster constituted by depressive symptoms, assessed by CDSS, was strongly correlated to BS measurement ($p<.001$). GAF scale score's relation with FBF resulted significant. Among QLS sub-scales, only the sub-scale named Intrapsychic foundations resulted statistically correlated with BS.

Then, we performed linear regressions for QLS and GAF scores with any clinical variable assessed. These analyses were performed to provide a preliminary screening of appropriate candidate variables for entry into a subsequent regression model, as described below. Due to the specific purpose of our study, only sets of predictors including FBF were next selected and analysed. Based on those preliminary univariate associations, a Bonferroni-like correction using an alpha

level <.01 was adopted for inclusion in the regression model. Six variables were selected for GAF model, including (i) PANSS-P, (ii) PANSS-N, (iii), PANSS-G, (iv) PANSS-total score, (v) CDSS, (vi) FBF for GAF. Six variables were selected for QLS-IF model, including (i) PANSS-P, (ii) PANSS-N, (iii), PANSS-G, (iv) PANSS-total score, (v) CDSS, (vi) FBF (**Table 3**).

The regression models selected by the stepwise method are shown in **Table 4** and **Figure 1**. After iterative stepwise entries, the combination of three predictor variables (i.e., positive symptoms, assessed by PANSS-P, negative symptoms, assessed by PANSS-N, BS, as rated by FBF) provided the best-fit GAF model for the data. The sample adjusted R square for the model was .393, indicating that approximately 39% of the variance of the GAF score in the sample can be accounted for by the combination of these three predictors. The combination of two predictor variables (i.e., BS and negative symptoms) provided the best-fit QLS-IF model for the data. The sample adjusted R square for the model was .383, indicating that approximately 38% of the variance of the QLS-IF score in the sample can be accounted for by the combination of these two predictors.

Discussion

The aim of the study was the analysis of the relations of BS with objective symptoms, functioning and quality of life in a population of outpatients with schizophrenia in a stable phase.

Firstly, we examined relationships between BS and schizophrenia symptoms. No correlations were found between FBF and positive symptoms, negative symptoms and general psychopathology assessed by PANSS, suggesting that BS are relatively independent from these schizophrenia objective symptoms. Previous studies showed mixed results about this subject. Yon et al. (2000) observed how, in several of the studies which analyzed this subject, the magnitude of the relations was low; the authors also underlined that, when the

Table 3. *Exploratory univariate linear regressions between GAF and QLS-IF and psychopatological indices*

	QLS-IF		GAF	
	β*	p	β*	p
PANSS-P	-.320	.000	-.464	.000
PANSS-N	-.608	.000	-.560	.000
PANSS-G	-.476	.000	-.511	.000
PANSS-T	-.567	.000	-.665	.000
CDSS	-.279	.002	-.272	.003
FBF	-.221	.013	-.217	.001

*=Standardized â
PANSS-P: Positive and Negative Syndrome Scale, Positive Symptoms; PANSS-N: Positive and Negative Syndrome Scale, Negative Symptoms; PANSS-G: Positive and Negative Syndrome Scale, General Psychopathology; PANSS-T: Positive and Negative Syndrome Scale, total score; CDSS: Calgary Depression Scale for Schizophrenia; QLS-IF: Quality of Life Scale, Intrapsychic foundations; GAF: Global Assessment of Functioning; FBF: Questionario dei Sintomi-Base.

Table 4. *Stepwise multiple regressions for variables contributing to with QLS-IF and GAF*

Dependent variable	Predictor	β*	t	p	R^{2**}
GAF	PANSS-N	-.442	-5.677	.000	
	PANSS-P	-.277	-3.535	.001	
	FBF	-.147	-2.015	.046	.393
QLS-IF	PANSS-N	-.595	-8.163	.000	
	FBF	-.155	-2.129	.035	.383

*: Standardized â
**: R^2 for the entire model
PANSS-P: Positive and Negative Syndrome Scale, Positive Symptoms; PANSS-N: Positive and Negative Syndrome Scale, Negative Symptoms; QLS-IF: Quality of Life Scale, Intrapsychic foundations; FBF: Questionario dei Sintomi-Base.

different dimensions of BS were taken into account, several were not related to the objective symptoms of schizophrenia. Factorial analyses confirmed the latter result, showing how only some of BS are related to objective symptoms, but not all of them (Yon et al. 2005, Nakaya et al. 2002). It must be noticed, also, that since their first definition by Huber and colleagues (1957) BS have been described as unrelated to objective symptoms. It's likely that, even if BS have a high inner coherence which explains the single-factor solution, they group symptoms only in part specifically related to schizophrenia. Studies which analyzed diagnostic specificity of BS underlined this possibility: only part of BS clusters showed specificity for schizophrenia, either when measured with FBF (Mass, 1998), or with another frequently used scale, the Bonn Scale for the Assessment of Basic Symptoms (BSABS) (Klosterkötter et al. 1996).

Moreover, a significant relation was found for BS and depressive symptoms, thus confirming Maggini and Raballo's findings (2006). The authors showed how depressed patients with schizophrenia scored higher on the BS scale, particularly in the cognitive, cenesthesic and affective clusters. Unfortunately, our analysis did not allow us to define if depression is a consequence of the presence of BS, or if they both derive from the same underlying patophysiological mechanism: respectively, Liddle's "psychological" and "neural" mechanisms (Liddle and Barnes 1988, Liddle et al. 1993).

The main finding of our analysis is the finding of the role played by BS in global functioning and QOL of the patients.

GAF scale is a quite complex and naturalistic outcome measure. It could be considered a "macrosocial" outcome measure, evaluating relatively complex aspects of functioning, in contrast with "microsocial" outcome measures, such as tests of interpersonal and social problem solving, that assess subcomponents of general functioning addressing more isolated skills in a laboratory context of community living (Spaulding et al. 1986). Furthermore, GAF scale is internationally recognized and of practical use in standard clinical trials. The statistically significant relation found in our study between BS and GAF underline how BS must be considered one of the important factors in determining patients' outcome. Studying functional outcome in schizophrenia is a matter of highest importance. It has been hypothesized that one of the primary reasons for the historical lack of improvement in functional outcome is a general lack of success in treating the aspects of schizophrenia that have the strongest associations with functional outcome (Burns and Patrick 2007, Green 1996, Green et al. 2000, Harvey et al. 2004).

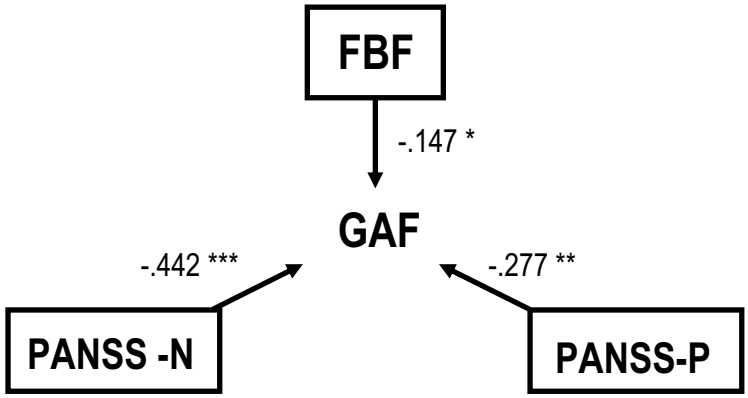
Another interesting finding of our study is the correlation of BS with patient's QOL, concerning the aspect of "intrapsychic foundations". This subscale identifies intrapsychic deficits that are seen as a core aspect of schizophrenia. As defined by Heinrichs and Carpenter (Heinrichs et al. 1984), QLS *intrapsychic foundations* scale gives a clinical judgment regarding intrapsychic elements in the dimensions of cognition, affectivity, drive, which are defined as close to the core of the pathology. Starting from these dimensions, motivation, curiosity, empathy, ability of experiencing pleasure and emotive interaction can be defined. So, intrapsychic foundation constitutes the "starting blocks" from which the QLS dimensions measured by the other QLS subscales (interpersonal relations, instrumental role, common objects and activities) are defined. For example, alteration of empathy can cause problems in interpersonal relationships; deficit of drive can have consequences in finding and maintaining a work; and so on. Once more BS show their characteristic of an underlying dimension close to the core of the disease that underlies the other functional deficits. BS are self-experiences, reported as abnormal and burdensome by the patients themselves and, not surprisingly, they would significantly impact on QOL. Being subjective, they remain predominately private and apparent only to the affected person. Even in patients with fully intact cognitive capacity, what usually gets described spontaneously are broad, nonspecific complaints such as having trouble concentrating or thinking (Schultze-Lutter 2009). On the contrary, even if significantly correlated with BS, depressive symptoms, as evaluated by the raters who performed the CDSS, didn't seem to predict QOL in our sample.

As for the impact of schizophrenic symptoms on QOL, negative symptoms as assessed by PANSS-N, seemed to predict *intrapsychic foundations* scale of QLS and global functioning, while positive symptoms as assessed by PANSS-P were found to predict only psychosocial functioning. Previous studies showed that symptomatology not only affects the ability of patients to assess QOL, but also has been assumed to play a substantial role in the patients' QOL (Wegener et al. 2005). However, evidence concerning the importance of psychiatric symptoms to QOL among individuals with schizophrenia has been substantially mixed, and it remains unclear which specific symptoms are most important to which dimensions of QOL and for whom these symptoms hold the greatest impact. Also, these controversial findings may be at least partially accounted for by differences in the stage of illness of samples examined (early course vs chronic population). In our previous work (Rocca et al. 2009) we analyzed if relationship between patterns of symptomatology and QOL change during the time course of schizophrenia. We found that after the 6 years-course of illness, negative symptoms remained the most reliable predictors of QOL, together with severity of illness, while positive and depressive symptoms had a minor role. It is possible that dealing with negative symptoms for such a long time could have had an impact on QOL that was greater compared to patients that dealt with these symptoms from less time. Thus, an explanation of the results of the present study could be the mean average duration of illness (±S.D.) of our sample that was 14.5 (±9.82) years. Also, some previous studies found that positive symptoms had also a smaller magnitude of association with objective than subjective measures of QOL (de Souza and Coutinho 2006).

This study has some strengths that should be noticed. First, our sample was relatively large and thoroughly characterized (homogenous with regard to stage of illness and treatment setting, clinically stable outpatients). Among the methodological problems in this area of research Green et al. (2000) pointed out small group size of several studies, heterogeneity in

Figure 1. *Multiple regressions with backward elimination with GAF and QLS-IF scores as dependent variables and psychopathogical indices as predictors*

a. GAF



b. QOL-IF

Over the arrows: standardized coefficients (β) showing single variable's weight.
*p=.000; **p=.001;***p=.046; ****p=.035; *****p=.000

FBF: Questionario dei Sintomi-Base; GAF: Global Assessment of Functioning; PANSS-P: Positive and Negative Syndrome Scale, Positive Symptoms; PANSS-N: Positive and Negative Syndrome Scale, Negative Symptoms; QLS-IF: Quality of Life Scale, Intrapsychic foundations.

diagnosis and inclusion of mixed groups of inpatients and outpatients. This point was particularly important due to the fact that there are systematic differences in how QOL interact with psychiatric symptoms among mixed samples of inpatients and outpatients or early course and chronic patients, and ignoring these differences would obscure the results (Eack and Newhill 2007). Second, all patients were diagnosed using a structured clinical interview (SCID) rather than clinical charts review. Third, we included in our study only patients with a diagnosis of schizophrenia rather than various psychotic disorders. Fourth, the subject of understanding how BS are directly related to QOL and outcome has been scarcely analyzed in literature.

In spite of these strengths, our study has some limitations: first, it was cross-sectional and so could not provide definite support for the direction of the relationship between the domains and their correlates. Second, the scale we used to assess QOL, the QLS, is a semi-structured, clinician rated interview, an instrument originally developed to evaluate deficit syndrome of schizophrenia. This issue rose some concern regarding the magnitude of the detected relationship between QOL and negative symptoms when the QLS is used. However, it has been demonstrated that QLS is a clinician rating scale with acceptable psychometric

properties, useful to assess symptoms levels and functional status of schizophrenic people without the deficit syndrome in longitudinal studies and trials (Kusel et al. 2007, Perlick et al. 2008). Finally, in his review, Priebe (2007) listed QLS among the most widely used disease-specific instruments to assess QOL in people with schizophrenia.

Conclusions

Our study contributes to underline the necessity to include BS among the clinical features of schizophrenic patients that must be object of attention.

Even if unrelated with objective symptoms assessed by PANSS, they showed a significant relation with an important dimension in the clinical picture of schizophrenia, that is depressive dimension. Moreover, BS showed to be able to influence global functioning and the some aspects of patient's QOL.

It can be said, in conclusion, that BS allow to reach deeper and fundamental psychopathological elements, whose presence is relevant during the whole course of the disease. This happens in spite of the relative independence of BS from the part of the contextual clinical and symptomatological picture, constituted by positive and negative symptoms, which is commonly considered the symptomatic characteristic of the disease. As underlined by other Authors, BS are often seen as being the subjective experiences that most closely reflect the basic biological defect assumed to be at the core of schizophrenic illness. They are the primary, "substrate-close" symptoms of schizophrenia, the first and most fundamental psychopathological expressions of the neurobiological processes underlying psychoses, thus the term "basic" (Huber 1983, Gross 1989, Huber and Gross 1989, Klosterkötter et al. 1997).

A very important finding of our work is the understanding of influence of BS in functioning and QOL. It is very important to search for mediators between clinical variables and functional outcome, since it is necessary to deepen the knowledge of what really influences patients' disability, in order to define precise targets of interventions and conceptualise appropriated therapies (Green et al. 2000).

References

American Psychiatric Association, APA (2000). *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR).* American Psychiatric Press, Washington, DC.

Addington D, Addington J, Schissel B (1990). A depression rating scale for schizophrenics. *Schizophrenia Research* 3, 247-251.

Altshuler LL, Gitlin MJ, Mintz J, Leight JL, Frye MA (2002). Subsyndromal depression is associated with functional impairment in patients with bipolar disorder. *Journal of Clinical Psychiatry* 63, 807-811.

Andreasen NC (1983). The Scale for the Assessment of Negative Symptoms (SANS). Iowa City, University of Iowa.

Barry MM (1997). Well-being and life satisfaction as components of quality of life in mental disorders. In: Katschnig H, Freeman H, Sartorius N (Eds) *Quality of Life in Mental Disorders*. New York, NY, Wiley, 31-42.

Bromet EJ, Naz B, Fochtmann LJ, Carlson GA, Tanenberg-Karant M (2005). Long-term diagnostic stability and outcome in recent first-episode cohort studies of schizophrenia. *Schizophrenia Bulletin* 31, 639-649.

Burns T, Patrick D (2007). Social functioning as an outcome measure in schizophrenia studies. *Acta Psychiatrica Scandinavica* 116, 403-418.

Cuesta MJ, Peralta V, Irigoyen I (1996). Factor analysis of the Frankfurt Complaint Questionnaire in a Spanish sample. *Psychopathology* 29, 1, 46-53.

de Souza LA, Coutinho ES (2006). The quality of life of people with schizophrenia living in community in Rio de Janeiro, Brazil. *Social Psychiatry and Psychiatric Epidemiology* 41, 5, 347-356.

Eack SM, Newhill CE (2007). Psychiatric symptoms and quality of life in schizophrenia: a meta-analysis. *Schizophrenia Bulletin* 33, 5, 1225-1237.

First MB, Gibbon M, Spitzer RL, Williams JBW, Benjamin LS (1997). *Structured Clinical Interview for DSM-IV Disorders (SCID).* American Psychiatric Press, Washington DC.

Fitzgerald PB, Williams CL, Corteling N, Filia SL, Brewer K, Adams A.(2001). Subject and observer-rated quality of life in schizophrenia. *Acta Psichiatrica Scandinavica* 103, 387–392.

Grant P, Beck AT (2008). Defeatist beliefs as a mediator of cognitive impairment, negative symptoms, and functioning in schizophrenia. *Schizophrenia Bulletin* Feb 27. [Epub ahead of print].

Green MF (1996). What are the functional consequences of neurocognitive deficits in schizophrenia? *American Journal of Psychiatry* 153, 321-330.

Green MF, Kern RS, Braff DL, Mintz J (2000). Neurocognitive deficits and functional outcome in schizophrenia: are we measuring the "right stuff"? *Schizophrenia Research* 26, 119-136.

Gross G (1989). *The* "basic" symptoms of schizophrenia. *British Journal of Psychiatry* Supplementum 7, 21-25.

Gross G (1997). The onset of schizophrenia. *Schizophrenia Research* 28, 2-3, 187-198.

Harvey PD, Green MF, Keefe RSE, Velligan DI (2004). Cognitive functioning in schizophrenia: a consensus statement on its role in the definition and evaluation of effective treatments for the illness. *Journal of Clinical Psychiatry* 65, 361-372.

Heinrichs DW, Hanlon TE, Carpenter WT Jr (1984). The Quality of Life Scale: an instrument for rating the schizophrenic deficit syndrome. *Schizophrenia Bulletin* 10, 3, 388-398.

Hirsch SR, Jolley AG, Barnes TR, Liddle PF, Curson DA, Patel A, York A, Bercu S, Patel M (1989). Dysphoric and depressive symptoms in chronic schizophrenia. *Schizophrenia Research* 2, 3, 259-264.

Hofer A, Baumgartner S, Bodner T, Edlinger M, Hummer M, Kemmler G (2005). Patient outcomes in schizophrenia II: the impact of cognition. *European Psychiatry* 20, 395-402.

Huber G (1957). Die coenësthetische schizophrenie. *Fortschritte für Neurologie und Psychiatrie* 25, 491–520.

Huber G, Gross G, Schüttler R (1979). *Schizophrenie. Eine verlaufs- und sozialpsychiatrische Langzeitstudie.* Berlin, Springer.

Huber G (1983). The concept of substrate-close basic symptoms and its significance for the theory and therapy of schizophrenic diseases. *Nervenarzt* 54, 1, 23-32.

Huber G, Gross G (1989). The concept of basic symptoms in schizophrenic and schizoaffective psychoses. *Recenti Prog Med* 80, 12, 646-652.

Huber G, Gross G (1995). The concept of basic symptoms and basic stages and its meaning for schizophrenia and schizoaffective psychoses. In C. Maggini (ed) *Psicopatologia e clinica della Schizofrenia*. ETS, Pisa, Italy, 41–58.

Jaeger J, Bitter I, Czobor P, Volavka J (1990). The measurement of subjective experience in schizophrenia: the Subjective Deficit Syndrome Scale. *Comprehensive Psychiatry* 31, 3, 216-226.

Jones SH, Thornicroft G, Coffey M, Dunn G (1995). A brief mental health outcome scale-reliability and validity of the Global Assessment of Functioning (GAF). *British Journal of Psychiatry* 166, 654-659.

Kaiser W, Priebe S (1998). Measuring changes in subjective quality of life in chronic schizophrenic patients. *Nervenarzt* 69, 3, 219-227.

Kay SR, Fiszbein A, Opler LA (1987). The positive and negative syndrome scale (PANSS) for schizophrenia. *Schizophrenia Bulletin* 13, 2, 261-276.

Klosterkötter J (1988). *Basissymptome und endphanomene der schizophrenie*. Springer, Berlin.

Klosterkötter J. (1992). The meaning of basic symptoms for the genesis of the schizophrenic nuclear syndrome. *Jpn Journal of Psychiatry Neurology* 46, 3, 609-30.

Klosterkötter J, Ebel H, Schultze-Lutter F, Steinmeyer EM (1996). Diagnostic validity of basic symptoms. *European Archives of Psychiatry and Clinical Neuroscience* 246, 3, 147-154.

Klosterkötter J, Schultze-Lutter F, Gross G, Huber G, Steinmeyer EM (1997). Early self-experienced neuropsychological deficits and subsequent schizophrenic diseases: an 8-year average follow-up prospective study. *Acta Psychiatrica Scandinavica* 95, 5, 396-404.

Kusel Y, Laugharne R, Perrington S, McKendrick J, Stephenson D, Stockton-Henderson J (2007). Measurement of quality of life in schizophrenia: a comparison of two scales. *Social Psychiatry and Psychiatric Epidemiology* 2007 42, 10, 819-823.

Lambert M, Naber D (2004). Current issues in schizophrenia: overview of patient acceptability, functioning capacity and quality of life. *CNS Drugs* 18, 2, 5-17.

Liddle PF, Barnes TR (1988). The subjective experience of deficits in schizophrenia. *Comprehensive Psychiatry* 29, 2, 157-164.

Liddle PF, Barnes TR, Curson DA, Patel M (1993). Depression and the experience of psychological deficits in schizophrenia. *Acta Psychiatrica Scandinavica* 88, 4, 243-247.

Loas G, Yon V, Brien D (2002). Dimensional structure od the Frankfurt Complaint Questionnaire. *Comprehensive Psychiatry* 43, 5, 397-403.

Maggini C, Raballo A (2006). Exploring depression in schizophrenia. *European Psychiatry* 21, 4, 227-232.

Malla AK, Norman RM, McLean TS, McIntosh E (2001). Impact of phase-specific treatment of first episode of psychosis on Wisconsin Quality of Life Index (client version). *Acta Psychiatrica Scandinavica* 103, 5, 355-361.

Martínez-Arán A, Vieta E, Colom F, Torrent C, Sánchez-Moreno J, Reinares M, Benabarre A, Goikolea JM, Brugué E, Daban C, Salamero M (2004). Cognitive impairment in euthymic bipolar patients: implications for clinical and functional outcome. *Bipolar Disorder* 6, 224-232.

Martinez-Aran A, Vieta E, Torrent C, Sanchez-Moreno J, Goikolea JM, Salamero M, Malhi GS, Gonzalez-Pinto A, Daban C, Alvarez-Grandi S, Fountoulakis K, Kaprinis G, Tabares-Seisdedos R, Ayuso-Mateos JL (2007). Functional outcome in bipolar disorder: the role of clinical and cognitive factors. *Bipolar Disorder* 9, 103-113.

Mass R, Haasen C, Krausz M (1997). Dimensional structure and diagnostic specificity of the Frankfurt Complaint Questionnaire. *European Psychiatry* 12, 3, 117-123.

Mass R, Weigel S, Schneider S, Klepsch R (1998). Schizophrenia-specific basic symptoms. A successful replication. *Psychopathology* 31, 3, 113-119.

Mass R, Schoemig T, Hitschfeld K, Wall E, Haasen C (2000). Psychopathological syndromes of schizophrenia: evaluation of the dimensional structure of the positive and negative syndrome scale. *Schizophrenia Bulletin* 26, 1, 167-177.

McGurk SR, Meltzer HY (2000a). The role of cognition in vocational functioning in schizophrenia. *Schizophrenia Research* 45, 175-184.

McGurk SR, Moriarty PJ, Harvey PD (2000b). Relationship of cognitive functioning, adaptive life skills, and negative symptoms severity in poor-outcome geriatric schizophrenia patients. *Journal of Neuropsychopharmacology and Clinical Neuroscience* 12, 257-264.

Milev P, Ho B, Arndt S, Andreasen NC (2005). Predictive values of neurocognition and negative symptoms on functional outcome in schizophrenia: a longitudinal first-episode study with 7-year follow-up. *American Journal of Psychiatry* 162, 495-506.

Nakaya M, Kusumoto K, Ohmori K (2002). Subjective experiences of Japanese inpatients with chronic schizophrenia. *Journal of Nervous and Mental Disorders* 190, 2, 80-85.

Narvaez JM, Twamley EW, McKibbin CL, Heaton RK, Patterson TL (2008). Subjective and objective quality of life in schizophrenia. *Schizophrenia Research* 98, 1-3, 201-208.

Nelson B, Yung AR, Bechdolf A, McGorry PD (2008). The phenomenological critique and self-disturbance: implications for ultra-high risk ("prodrome") research. *Schizophrenia Bulletin* 34, 2, 381-392.

Norman RM, Malla AK, McLean T, Voruganti LP, Cortese L, McIntosh E (2000). The relationship of symptoms and level of functioning in schizophrenia to general wellbeing and the Quality of Life Scale. *Acta Psychiatrica Scandinavica* 102, 303–309.

Pallanti S, Quercioli L, Pazzagli A. (1997). Relapse in young paranoid schizophrenic patients: a prospective study of stressful life events, P300 measures, and coping. *American Journal of Psychiatry* 154, 6, 792-8.

Pallanti S, Quercioli L, Pazzagli A (1999). Basic symptoms and P300 abnormalities in young schizophrenic patients. *Comprehensive Psychiatry* 40, 5, 363-371.

Peralta V, Cuesta MJ, de Leon J (1992). Positive versus negative schizophrenia and basic symptoms. *Comprehensive Psychiatry* 33, 3, 202-206.

Perlick DA, Perlick DA, Rosenheck RA, Kaczynski R, Bingham S, Collins J (2008). Association of symptomatology and cognitive deficits to functional capacity in schizophrenia. *Schizophrenia Research* 99, 1-3, 192-199.

Priebe S (2007). Social outcomes in schizophrenia. *British Journal of Psychiatry* Supplementum 50, 15-20.

Rey ER (1982). *Identifizierung und Verlauf kognitiver Störungen Schizophrener. Arbeitsbericht des Sonderforschungsbereiches* 116 (Psychiatrische Epidemiologie), Zentralinstitut für Seelische Gesundheit, Fribourg, 139–290.

Ritsner M, Kurs R, Gibel A, Ratner Y, Endicott J (2005). Validity of an abbreviated quality of life enjoyment and satisfaction questionnaire (Q-LES-Q-18) for schizophrenia, schizoaffective, and mood disorder patients. *Quality of Life Research* 14, 7, 1693-1703.

Ritsner M, Gibel A, Ratner Y (2006). Determinants of changes in perceived quality of life in the course of schizophrenia. *Quality of Life Research* 15, 3, 515-526.

Rocca P, Bellino S, Calvarese P, Marchiaro L, Patria L, Rasetti R (2005). Depressive and negative symptoms in schizophrenia: different effects on clinical features. *Comprehensive Psychiatry* 46, 304-310.

Rocca P, Giugiario M, Montemagni C, Rigazzi C, Rocca G, Bogetto F (2009). Quality of life and psychopathology during the course of schizophrenia. *Comprehensive Psychiatry* 50, 6, 542-548.

Rösler M, Bellaire W, Hengesch G, Kiesling-Muck H, Carls W (1985). Die uncharakteristischen Basissymptome des Frankfurter-Beschwerdefragebogens und ihre Beziehungen zu psychopathologischen Syndromen. *Nervenarzt* 56, 259–264.

Sass LA, Parnas J (2003). Schizophrenia, consciousness, and the self. *Schizophrenia Bulletin* 29, 3, 427-44.

Schultze-Lutter F (2009). Subjective symptoms of schizophrenia in research and the clinic: the basic symptoms concept. *Schizophrenia Bullettin* 35, 1, 5-8.

Schünemann-Wurmthaler S (1984). *Subjektive Basisstörungen*

der Schizophrenie: Die Standardisierung ihrer Erhebung und ihre Einordnung in den Rahmen schizophrener Symptomatik. Lang, Stuttgart.

Sim K, Mahendran R, Siris SG, Heckers S, Chong SA (2004). Subjective quality of life in first episode schizophrenia spectrum disorders with comorbid depression. *Psychiatry Research* 129, 2, 141-147.

Spaulding WD, Storms L, Goodrich V, Sullivan M (1986). Application of experimental psychopathology in psychiatric rehabilitation. *Schizophrenia Bulletin* 12, 4, 560-577.

Stanghellini G, Quercioli L, Ricca V, Strik WK, Cabras P (1991). Basic symptoms and negative symptoms in the light of language impairment. *Comprehensive Psychiatry* 32, 2, 141-146.

Süllwold L (1986). Frankfurter Beschwerde Fragebogen. In Sullwold L, Huber G, *Schizophrene Bassistorungen*. Springer, Berlin, Germany, 145-159.

Uhlhaas PJ, Mishara AL (2007). Perceptual anomalies in schizophrenia: integrating phenomenology and cognitive neuroscience. *Schizophrenia Bulletin* 33, 1, 142-156.

Velligan DI, Bow-Thomas CC, Mahurin RK, Miller AL, Halgunseth LC (2000). Do specific neurocognitive deficits predict specific domains of community function in schizophrenia? *Journal of Nervous and Mental Disorder* 188, 518-524.

Wegener S, Redoblado-Hodge MA, Lucas S, Fitzgerald D, Harris A, Brennan J (2005). Relative contributions of psychiatric symptoms and neuropsychological functioning to quality of life in first-episode psychosis. *Australian and New Zealand Journal of Psychiatry* 39, 6, 487-92.

Wittorf A, Wiedemann G, Buchkremer G, Klingberg S (2008). Prediction of community outcome in schizophrenia 1 year after discharge from inpatient treatment. *European Archives of Psychiatry and Clinical Neuroscience* 258, 48-58.

Woods SW (2003). Chlorpromazine equivalent doses for the newer atypical antipsychotics. *Journal of Clinical Psychiatry* 64, 663-667.

Yon V, Loas G (2000). Relationships between subjective experiences of deficit and other psychopathological features in schizophrenia. *Psychopathology* 33, 3, 110-114.

Yon V, Loas G, Brien D (2005). Subjective experiences and the psychopathological dimensions in schizophrenia. *Psychiatry Research* 137, 1-2, 93-102.

Yon V, Loas G, Monestes JL (2008). Dimensional structure of the Frankfurt Complaint Questionnaire in a sample of French students. *Psychopathology* 41, 2, 85-9.