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This is the author's manuscript

Original Citation:

Availability:

This version is available <http://hdl.handle.net/2318/1558783> since 2017-01-10T16:13:20Z

Published version:

DOI:10.1016/j.eurpsy.2015.11.007

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A cluster-analytical approach toward real-world outcome in outpatients with stable schizophrenia

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Abstract

Background

This study aims to empirically identify profiles of functioning, and the correlates of those profiles in a sample of patients with stable schizophrenia in a real-world setting. The second aim was to assess factors associated with best profile membership.

Methods

Three hundred and twenty-three outpatients were enrolled in a cross-sectional study. A two-step cluster analysis was used to define groups of patients by using baseline values for the Heinrichs-Carpenter Quality of Life Scale (QLS) total score. Logistic regression was used to construct models of class membership.

Results

Our study identified three distinct clusters: 50.4% of patients were classified in the “moderate” cluster, 27.9% in the “poor” cluster, 21.7% in the “good” cluster. Membership in the “good” cluster versus the “poor” cluster was characterized by less severe negative (OR = .832) and depressive symptoms (OR = .848), being employed (OR = 2.414), having a long-term relationship (OR = .256), and treatment with second-generation antipsychotics (SGAs) (OR = 3.831). Nagelkerke R² for this model was .777.

Conclusions

Understanding which factors are associated with better outcomes may direct specific and additional therapeutic interventions, such as treatment with SGAs and supported employment, in order to enhance benefits for patients, as well as to improve the delivery of care in the community.

Keywords

Schizophrenia; Quality of life; Real-world outcome; Milestones; Cluster analysis

1. Introduction

Despite innovations in therapeutic and psychosocial interventions, schizophrenia remains a highly disabling illness, affecting multiple areas of everyday functioning, such as social, vocational and residential domains, even during symptom remission [1].

Heterogeneity of response and outcome is common among patients with schizophrenia [2]. It has been suggested that the definition of “outcome” in schizophrenia may need to be broadened beyond symptom severity to also include quality of life (QOL), subjective well-being, health status, use of healthcare services, and measures of the patients’ level of functioning [3], [4] and [5].

In particular, QOL measurements are increasingly considered to be an important way of evaluating the treatments and care provided to patients with schizophrenia [6] and [7]. Using QOL measures may provide clinicians with information regarding the general health status of their patients that might otherwise go unrecognized thereby improving patient satisfaction and health outcomes [8].

At present, the health-related quality of life instrument used most frequently in schizophrenia research is the Heinrichs-Carpenter Quality of Life Scale (QLS) [9], a clinician-rated scale of patients’ social, occupational, and psychological functioning.

QLS is one of the 6 functional outcome scales selected in the Validation of Everyday Outcomes (VALERO) [10] and [11].

Matching an individual patient to a subgroup of patients with a similar functioning profile may help clinicians tailor treatment alternatives that best meet individual patients’ long-term needs and facilitate the translation of the evaluation of the patient into terms that can be easily communicated to the patients and their families [12], [13] and [14]. The practical implications of this process in clinical routine care could be the identification of very disabled patients that need more intensive special rehabilitation in residential facilities or through home visits [15].

A few previous attempts have been made to classify schizophrenia patient functioning according to severity [4] and [16], but none have used an empirically driven approach that focused only on functioning. While Lipkovich et al. [4] created a data-driven classification that combined symptomatology and functioning using the QLS and the Positive and Negative Syndrome Scale [17], Stahl et al. [16] used theoretically based criteria to classify patients using the QLS.

Ascher-Svanum et al. [12] used an empirical approach to identify and validate the classification of patients with schizophrenia in “good”, “moderate” or “poor” functioning groups based on the assessment of functional measures, the QLS, the 36-item Short-Form Health Survey (SF-36) [18] Mental Component Summary Score, and a productivity measure.

In the current study, we sought to explore whether we could use the QLS to identify different profiles of functioning in a sample of patients with stable schizophrenia in a real-world setting and to determine whether participants with these different profiles have different levels of clinical severity, depression, insight, and different associations with functional variables including the “occupational/vocational” status and “social relationships”, assigned treatment or socio-demographic variables. Further aim was to assess factors associated with cluster affiliation.

In line with previous research, we predicted that patients with lower psychotic symptomatology severity and with less severe depressive symptoms [19] would exhibit better functional level. Moreover, given work linking first-generation antipsychotics (FGAs) compared to second-generation ones (SGAs) [20] and poorer insight to poorer social [21], [22] and [23] we anticipated that patients receiving FGAs, compared to SGAs, and with poorer insight would have poorer social functioning.

2. Materials and methods

2.1. Participants

The study has been conducted at the Department of Neuroscience, University of Turin, Struttura Semplice di Coordinamento a Valenza Dipartimentale (SSCVD), Department of Mental Health ASL TO1- A.O.U. Città della Salute e della Scienza di Torino, Italy, during the period between July 2008 and July 2011.

Patients were initially evaluated by a clinician-psychiatrist, and if they met Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) [24], they were seen subsequently by our research team (C.M., M.S.). Of these, a sample of consecutive subjects routinely treated in a community setting and fulfilling the following criteria were included in the study:

- men and women in the 18–65 years age group;
- diagnosis of schizophrenia according to the DSM-IV-TR, confirmed by two expert clinicians (C.M., M.S.) using the Structured Clinical Interview for DSM-IV disorders (SCID) [25]. 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 \geq 48 hours) and a diagnosis of a psychiatric disorder due to a general medical condition;
- patients with stable schizophrenia (no increase in symptomatology/no change in antipsychotic regimen for at least 6 months). The choice of antipsychotic drug prescribed and dosage were left to the discretion of the treating physicians.

Patients were evaluated using a semistructured interview to assess demographic features. All patients were submitted to standard care (Standard of Care-SoC), provided in community mental health centers in Italy, including pharmacological treatment as recommended by the guidelines [26] and [27], clinical monitoring at least on a monthly basis, home care when required, and psychological interventions tailored to patient's needs.

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) and was approved by the Local Research Ethics Committee (LREC).

2.2. Psychiatric assessment

Overall severity of illness was rated using the Clinical Global Impression-Severity scale, CGI-S [28].

Current levels of psychopathological symptoms were assessed using the Positive and Negative Syndrome Scale (PANSS), which includes Positive Symptoms (PANSS-P), Negative Symptoms (PANSS-N), and General Psychopathology (PANSS-G) subscales [29]. Depressive symptoms were evaluated using the Calgary Depression Scale for Schizophrenia (CDSS) [30].

To quantify patients' global functioning, we used the Global Assessment of Functioning scale (GAF) [31]. For the purpose of our study, raters were instructed to use the GAF to measure only psychosocial functioning in the month before rating [32], [33] and [34].

We used the Scale for the Assessment of Unawareness of Mental Disorder, SUMD, to assess insight [35]. For the purposes of this study, we used three items of the SUMD:

- awareness of mental illness (SUMD 1);
- awareness of the need for treatment (SUMD 2);
- awareness of the social consequences of disorder (SUMD 3).

Real-world functioning was assessed using the QLS [9]. It includes 21 items rated by the clinician on 7-point scales in 4 domains: interpersonal relations and social network (IRSN), instrumental role functioning (IRF), intrapsychic foundations (IF), and common objects and activities (COA). We chose to use only QLS total score as clustering indicator because the primary endpoint of many psychopharmacological studies of treatments for schizophrenia was change from baseline to endpoint on the QLS total score [36], [37], [38], [39], [40], [41] and [42]. Moreover, the QLS total score measures effects beyond functioning in patients with schizophrenia; it also assesses the richness of personal experience, the quality of interpersonal relations, and productivity in occupational roles.

2.3. Functional milestones achievements

Functional milestones were defined in line with Harvey et al. [43] and included social outcomes such as ever being married, currently or previously engaged, which we categorized as current or former relationship vs none. Vocational outcome was categorized as employed vs not employed.

We collected information from patients, informants, and medical records on the achievement of functional milestones. In cases of uncertainty, a consensus was obtained through discussion with the principal investigator (P.R.) and the interviewer.

Clinical ratings were done by research psychiatrists who were well-trained and experienced in the rating scales. In order to maintain high inter-rater reliability and to prevent rater drift, raters met at least once a month for training and reliability retesting.

2.4. Statistical analysis

Statistical analyses were performed using the software Statistical Package for the Social Sciences, SPSS, version 21 for Windows (SPSS, Chicago, IL, USA).

Data are presented as means \pm standard deviations (SD) or percentages (%), unless stated otherwise.

Analyses were planned in 2 stages.

In stage 1, to identify patient subgroups, a cluster-analytic approach was chosen [13] and [44]. To minimize the dependence of the solution on the method chosen, we decided to perform a two-step cluster analysis (TSCA) [45], [46] and [47], using QLS total score as input data. TSCA is a procedure designed to reveal groupings (i.e., clusters) within a dataset that would not otherwise be apparent. The algorithm employed has several desirable features that differentiate it from traditional cluster techniques. These include: analyzing large data files, handling of both categorical and continuous variables as well as automatic selection of the number of clusters. A computer algorithm inductively determines the number of clusters based on the Log-likelihood distance and Schwarz's Bayesian Criterion (BIC) for clustering.

A bootstrapping technique was applied to derive robust estimates of standard errors and confidence intervals for the mean values of QLS scores in the subgroups identified by cluster analysis and for all regression coefficients in the regression analyses within each of the subgroups. Specifically, the sample's QLS scores were split into three subgroups identified by the cluster analysis; QLS was chosen as the classification variable and we simulated 1000 bootstrapped samples with 95% confidence intervals. The same number of samples and the confidence intervals were also applied to estimate bootstrapped regression coefficients for each of the three subgroups.

In stage 2, in order to examine whether the identified subgroups differed in external variables that were not included in the clustering process, and consequently to validate the found functional profiles, we performed chi² tests for categorical variables and analyses of variance (ANOVA) for continuous variables.

In the case of a significant F from one or more ANOVAs, post hoc pairwise comparisons were performed using Bonferroni's test. In the case of categorical data, Fisher's exact test was used to compute the three pairwise comparisons between the clusters. In order to control for Type 1 error, alpha was set at .016 (.05/3).

We did not control for covariates as we investigated natural groups instead of experimental groups [48], [49] and [50].

Logistic regression was used to construct models of class membership using any significant variables in the initial bivariate analyses ($P < .05$): patient demographics, disease history, symptom severity, functional variables including the "occupational/vocational" status and "social relationships" assessed by means of 1-item questions with yes/no categories and assigned treatment separated into SGAs and FGAs. Odds ratios with the respective 95% confidence intervals are given.

Collinearity diagnostics analyses were included in the logistic regression models.

3. Results

We screened 464 patients with schizophrenia of either sex, aged between 18 and 65 years. Ninety-two patients were not in stable phase, 372 met the inclusion criteria, 49 refused to participate to the study and 323 agreed. The proportion of patients which was ultimately recruited was 86.8% (323/372).

One hundred and eighty-eight (58%) patients were male, the mean age was 40.6 years (S.D. = 10.9) years, the mean duration of illness was 14.8 years (S.D. = 10.1), and the mean years of schooling were 10.9 (S.D. = 3.55).

They had a DSM-IV-TR diagnosis of schizophrenia paranoid subtype (n = 187, 58%), undifferentiated subtype (n = 65, 20%), residual subtype (n = 39, 12%) and disorganized subtype (n = 32, 10%). The mean PANSS total score was 69.2 (S.D.=22.9), indicating that patients were mildly-moderately ill. The mean QLS total score was 65.5 (\pm 22.5), indicating moderate level of functioning. Seventy-eight (24%) patients achieved a long-term relationship and ninety-two (28%) patients were employed. Two hundred and sixteen (67%) patients were treated with SGAs, 107 (33%) were under FGAs. Patients participated in psychological interventions, consisting of patient psychoeducation (245, 75.7%) and family psychoeducation (42, 13.0%).

3.1. Cluster analysis and description

Cluster analysis led us to the selection of a 3-cluster solution. Bootstrapped standard errors for QLS estimates in the three subgroups do not overlap, confirming the validity of the subgroups discovered (data not shown). The Silhouette value of cohesion (more than .50) shows that a reasonable structure has been found.

Three distinct clusters of patients were identified based on QLS total score and labeled from the “best” to the “worst” cluster, with level of functioning influencing cluster order. Approximately one-half of patients (n = 163, 50.4%) belong to the “middle” cluster, 21.7% to the “worst” cluster and 27.9% to the “best” cluster (**Table 1**).

Each cluster is characterized by a unique functional and symptom severity profile. Patients in the “best” cluster have the best outcome with minimal residual psychiatric symptoms and relatively good functioning. By contrast, patients in the “worst” cluster have the worst outcome with moderate to severe psychiatric symptoms and severe functional deficits. Patients in the “middle” cluster show levels of symptom severity, levels of insight and functional deficits that are intermediate between the two extremes.

The percentage of female patients, and mean years of education appear to be roughly similar across the clusters. Significant overall differences were found between the three clusters with regard to age, length of illness, employment and partnership status, psychotic symptoms, depression, insight, and assigned treatment. Pairwise comparisons revealed there are significant differences between the “best” and “middle” clusters, and between the “best” and “worst” clusters in age, length of illness, in PANSS total, negative, positive, and general psychopathology subscale scores, in CDSS total score, in SUMD subscale scores, and in the proportion of patients with a long-term relationship, with employment, and treated with SGAs. No significant differences between the “middle” and the “worst” clusters were found in age, length of illness, depressive symptom severity, awareness of the need for treatment, and in the proportion of patients with a long-term relationship.

3.2. Membership in the best cluster

To identify factors associated with “good” outcome, we constructed two logistic regression models. The odds for good outcome, represented by the best cluster, were estimated against the middle and the worst clusters (Table 2).

The “Tolerance” and “VIF” values for the two models are all quite acceptable (data not shown), indicating that the investigated variables don’t contain redundant information.

Membership in the best cluster is associated with lower scores for general psychopathology, negative and depressive symptoms, and a higher proportion of employed patients, with a long-term relationship and treated with SGAs. Patients in the best cluster have shorter duration of illness and higher functioning than patients in the middle cluster.

Nagelkerke R² for the first model is .777. The percentages of sensitivity and the specificity are respectively 85.7 and 89.9.

Nagelkerke R² for the second model is .472. The percentages of sensitivity and the specificity are respectively 61.4 and 92.6.

4. Discussion

To our knowledge, this study is the first empirical classification of chronically ill patients with stable schizophrenia treated in usual care settings in Italy based on their level of functioning.

Our analysis identified three distinct clusters, characterized by high, moderate, and low QLS score.

Although frequently used in schizophrenia research, interpretation of the QLS score has never been elucidated beyond stating that higher scores mean better functioning. Due to the lack of scale cut-off scores for various levels of functioning, it is unclear which scores may reflect patients' "good", "moderate", or "poor" levels of functioning. A recent study using an empirical approach to identify and validate the classification of schizophrenia patients in "good", "moderate", or "poor" functioning has identified "good" functioning as a QLS total score ≥ 84.5 [12].

The three clusters were distinguished not only by functioning level but were further associated with distinct patterns of socio-demographic and clinical variables, thus helping us to better understand which additional factors may promote each functioning profile.

4.1. QLS and socio-demographic characteristics/clinical severity

The "good" cluster included mostly younger patients with a shorter duration of illness than patients in the "poor" cluster.

As predicted, the best cluster had lower severity level of schizophrenia symptoms as shown by PANSS and CGI-S scores. The two extreme clusters were characterized by mildly ill patients as regards psychopathology and markedly ill patients, respectively. The "moderate" cluster contained moderately ill patients. The meaning of the PANSS total scores has been previously delineated in an empirical manner [17]. The relationship between the CGI-S and the PANSS followed an increasing trend. Although prior studies utilized varying endpoints, methods, and research designs, the concordance between high severity of symptoms and low QOL are known from several cross-sectional [51], [52], [53], [54], [55] and [56] and longitudinal studies [4], [5], [57], [58] and [59] using data from patients in clinical trial settings, although not all studies support this finding [4].

4.2. QLS and depression

The group in the “good” cluster exhibited the less severe level of depressive symptoms, while somewhat surprisingly both the “moderate” and “poor” clusters had equivalent levels of depressive symptoms. However, the mean CDSS score in the three clusters was below 6, i.e. the proposed score to separate schizophrenia patients with depression from those without [60], [61] and [62]. On the other hand, a study has found CDSS scores of at least 4 points, as in the “poor” and in the “moderate” clusters, to detect minor depression in schizophrenia patients [63]. Depressive symptoms were found to negatively predict QOL in outpatients with schizophrenia in a number of previous studies, even if with a larger relationship with subjective rather than objective QOL [64]. As expected, a chronic and disabling mental illness like schizophrenia is not limited to the symptoms of illness. There is a “second illness”: the reactions of the social environment to the stigma [65] and the self-stigma of the patients [55], [66] and [67] that negatively predict depression and reduces QOL [68]. It is possible that these and other possible analogous phenomena related to depressive symptoms [69] have a major impact on QOL. In addition, the question whether depression in schizophrenia influences QOL or whether a low QOL causes depressive symptoms remains unclear. In a previous study [70], we hypothesized a transactional model in which depression and QOL interact each other, exacerbating both depressive symptoms and impaired QOL.

4.3. QLS and insight

Results supported the hypothesis that different levels of functioning were associated with different profiles of awareness of illness. Insight was better in the “good” functioning cluster and worse in the “poor” functioning cluster. Unexpectedly, concerning the awareness of the need of treatment the “moderate” and the “poor” clusters showed equivalent profiles. On the other hand, awareness was not a factor associated with cluster affiliation. Moreover, in our sample mean ratings of SUMD (with the exception of the SUMD social consequences in the “poor” cluster) were below the threshold mean score of ≤ 3.0 , that identifies patients with a generally “preserved” insight, as suggested by other studies [71], [72], [73] and [74].

4.4. QLS and functioning

A pattern of deterioration from “good” through “moderate” to “poor” was seen for the GAF, whose scores confirmed and corroborated clusters’ level of functioning. In particular, the mean GAF score in the “poor” cluster was 45.0, i.e. below the cut-off for the definition of a severe mental illness [75]. Clinically, the GAF scale, which takes approximately 5 min to complete, appears to be a good proxy for the prediction of QLS.

Significant differences exist between clusters in terms of functional milestones, since patients in the “good” cluster were more likely to be engaged in a relationship and employed than patients in the “poor” cluster.

4.5. QLS and pharmacological treatment

Furthermore, when treatment was considered, as predicted, the “good” cluster had a significantly higher proportion of patients treated with SGAs. It is not clear how antipsychotics could affect social functioning. Two possible mechanisms have been suggested. First, antipsychotics could improve psychopathological symptoms. Second, antipsychotics could have an impact on cognitive symptoms that are illness-related,

therefore patients might be more likely to establish and maintain useful relationships and improve social outcomes [76].

4.6. Membership in the best cluster

This study identified a small set of variables that were associated with good functioning: fewer negative symptoms, less severe depressive symptoms, being employed, having a long-term relationship, and treatment with SGAs. Of particular interest, the results indicate that being employed and receiving SGAs were associated with a twofold to threefold increased risk of “good” cluster affiliation. However, the result that a treatment with SGAs would predict for cluster membership and thereby for outcome should be interpreted with caution, as antipsychotics were not randomly assigned. It cannot be excluded that the choice of SGAs versus FGAs was influenced by factors which were not assessed, thereby favoring the group receiving SGAs.

Overall, our conceptual framework identified membership in the “good” cluster versus the “poor” cluster at good level and versus the “moderate” cluster at an acceptable level — comparable to or higher than most QOL studies — especially considering the diversity of the sample [77], [78] and [79]. The factors most consistently associated with “good” cluster affiliation were found to be a long-term relationship, employment, and treatment with SGAs. These factors are potentially modifiable and/or easy to assess, thus enabling clinicians to better understand and help optimize the treatment plan for the patient [14].

4.7. Limitations and strengths

The study had a number of limitations that should be highlighted. First, because of the cross-sectional design, we were not able to determine the natural stability of these subtype groupings over the course of the illness as well as clinical and intervention factors that may affect that stability. Second, to be eligible for this study patients had to be outpatients meeting criteria for psychiatric stability, consequently they were not representative of patients in acute phases or in other clinical settings. Third, 13% of the eligible patients refused to participate, which poses a selection bias. Fourth, it should be noted that cluster analysis is very exploratory in nature and the results are highly dependent on the selected variables. Lastly, there may be additional predictors not assessed, thus not explored, that may play an important role in patients’ long-term outcomes.

Despite these limitations, there are some strengths of our work that should be noted: the large number of patients and the naturalistic design without selection bias related to randomized controlled designs. Indeed, since data from randomized controlled trials provide efficacy data in a relatively homogenous population under artificial circumstances, it is reassuring to find that these results are confirmed in usual practice real-world settings. Indeed, if a cluster solution is repeatedly discovered across different samples from the same general population, it is reasonable to conclude that it has some kind of general utility [80].

5. Conclusions

Our study suggests there continues to be a great need for improvement in the health status of chronically ill patients with schizophrenia [14], even if in a group of “mostly chronic” patients a significant proportion of patients were found to reach a good functioning.

Understanding which factors are associated with better outcomes may also direct specific and additional therapeutic interventions, such as SGAs treatment and supported employment, in order to enhance benefits for patient, as well as to improve the delivery of care in the community.

Disclosure of interest

The authors declare that they have no competing interest.

Table 1.

Cluster characteristics in observed variables and differences among clusters.

Variable	Good QOL 98.1 (±11.7)	Moderate QOL 65.8 (±8.15)	Poor QOL 39.8 (±9.76)	ANOVA F/ χ^2	Post hoc comparisons P < .05
Gender, M/F ^a	39/31	92/71	57/33	1.360	
Age, years ^a	36.5±8.65	40.2±10.6	44.2±12.1	10.540*	3>2; 3>1
Education ^a	11.6±3.45	10.9±3.49	10.4±3.70	2.180	
Illness duration ^a	10.7±8.42	15.0±9.32	17.6±11.5	9.957*	3>2; 3>1
Hospitalizations ^a	3.87±4.37	4.71±6.00	4.62±5.77	.567	
Single, N(%) ^a	45 (64)	129 (89)	71 (89)	14.604**	3>1; 2>1
Employment, N(%) ^a	35 (50)	47 (29)	10 (11)	39.931*	3<1
SGAs treated, N(%) ^a	55 (79)	102 (63)	49 (54)	21.039*	3<1; 3<2; 2<1
PANSS-T ^a	52.8±20.1	67.7±19.4	84.7±21.0	51.175*	3>2; 3>1; 2>1
PANSS-P ^a	11.5±5.33	14.5±6.25	17.5±7.92	16.448*	3>2; 3>1; 2>1
PANSS-N ^a	13.7±7.41	19.0±7.41	25.4±7.14	51.483*	3>2; 3>1; 2>1
PANSS-G ^a	29.1±11.2	35.1±11.4	43.0±11.7	30.095*	3>2; 3>1; 2>1
CDSS ^a	2.81±4.29	4.44±4.26	5.09±4.17	5.937***	3>2; 3>1
SUMD illness ^a	1.97±1.11	2.14±1.11	2.77±1.34	11.599*	3>2; 3>1; 2>1
SUMD drugs ^a	1.83±.92	2.29±1.14	2.59±1.26	11.894*	3>2; 3>1
SUMD social ^a	2.21±1.21	2.76±1.23	3.44±1.16	20.929*	3>2; 3>1; 2>1
GAF ^a	68.2±13.2	54.3±13.0	45.0±11.8	65.496*	1>2; 1>3; 2>3
CGI-S ^a	3.40±1.13	4.13±.96	4.93±.98	46.616*	1<2; 1<3; 2<3

SGAs: second-generation antipsychotics; PANSS-T: Positive and Negative Syndrome Scale (PANSS) Total Score; PANSS-P: PANSS Positive Symptoms; PANSS-N: PANSS Negative Symptoms; PANSS-G: PANSS-General Psychopathology; CDSS: Calgary Depression Scale for Schizophrenia; SUMD illness: scale for the Assessment of Unawareness of Mental Disorder, awareness of mental illness; SUMD drugs: SUMD awareness of the need for treatment; SUMD social: SUMD awareness of the social consequences of disorder; CGI-S: Clinical Global Impression Scale, Severity; GAF: Global Assessment of Functioning scale. ANOVA: *P = .000; **P = .001; ***P = .003. 1 = good; 2 = moderate; 3 = poor.

^a Mean ± SD.

Table 2.

Predictors of “good” cluster affiliation vs. “poor” cluster and vs. “moderate” cluster-logic regression.

Significant predictors in the Model	“good” cluster vs “poor” OR (95 % CI)	<i>P</i>	“good” cluster vs “moderate” OR (95 % CI)	<i>P</i>
Illness duration			.943 (.892–.997)	.040
PANSS-N	.832 (.741–.935)	.000	.926 (.868–.988)	.020
PANSS-G	1.117 (1.1012–1.232)	.002	1.074 (1.012–1.139)	.018
CDSS	.848 (.738–.976)	.021	.875 (.786–.973)	.014
GAF			1.062 (1.020–1.104)	.003
Single	.256 (.068–.965)	.044	.383 (.175–.842)	.017
Employment	2.414 (1.012–13.157)	.048	1.978 (1.095–3.592)	.047
Treatment with SGAs	3.831 (1.092–15.309)	.047	2.506 (1.043–6.019)	.040

SGAs: second-generation antipsychotics; PANSS-P: Positive and Negative Syndrome Scale (PANSS) Positive Symptoms; PANSS-N: PANSS Negative Symptoms; PANSS-G: PANSS-General Psychopathology; CDSS: Calgary Depression Scale for Schizophrenia; GAF: Global Assessment of Functioning.

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