

# Advances in Schizophrenia Research

## Chapter 1

### Symptomatic remission and functional recovery in outpatients with Schizophrenia

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#### Abstract

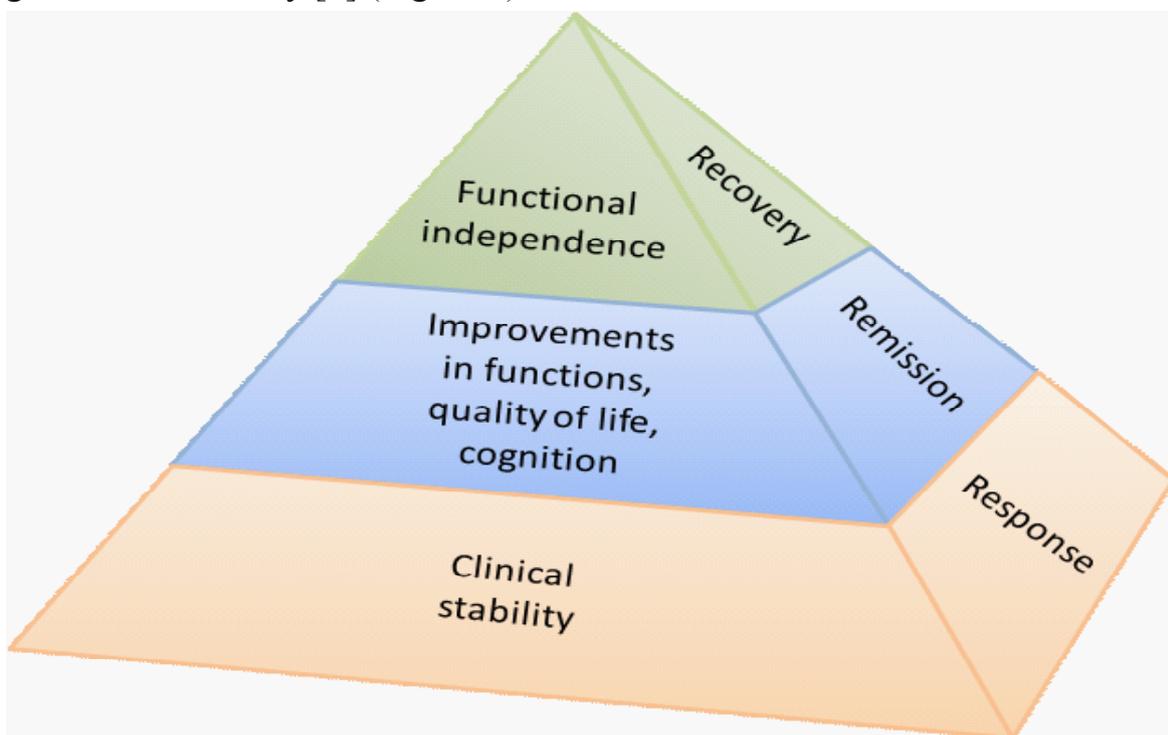
The present study was conducted to examine the rates of symptomatic remission, the level of community functioning; and to assess functional recovery in a sample of chronic schizophrenia out-patients; to compare recovered versus non-recovered patients according to demographic and clinical variables; and to identify predictive factors for recovery. Results indicate that 48.4% (n=92) patients fulfilled the criteria of symptomatic remission. The level of social functioning according to the mean GAF score of was 60.3 (S.D.=8.7). Considering the four criteria to attain recovery; 48.4% (n=92) patients met the criteria of symptomatic remission, followed by 46.3% (n=88) who met the criteria of vocational functioning, 26.3% (n=50) for peer relationships, and independent living was met by only 23.7% (n=45) of the sample. From these four criteria, a total of 10.5% (n=20) of the patients were considered to attained functional recovery as they met the required criteria. Functioning was higher in recovered patients with a GAF of 72.2 compared to a GAF of 58.8 in non-recovered patients. The logistic regression model included 2 predictors for recovery: 1) increased age of illness onset ( $\geq 23$  years old) and, 2) better functioning according to a higher GAF score ( $\geq 60$  points). The results of this study indicate that symptomatic remission and functional recovery can be attainable goals in Mexican patients with schizophrenia.

**Key words:** schizophrenia; symptomatic remission; functional recovery; functioning

## 1. Introduction

Schizophrenia has been considered as a long term chronic illness with poor outcome characterized by progressive clinical, social cognitive and vocational deterioration [1]. This disease has often been reported as a chronic debilitating disorder with a deteriorating course and little or no hope for attaining and sustaining recovery [2]. In the past, treatment was focused on reducing psychotic symptoms by using antipsychotic medications to achieve clinical stability. While Clinical remission has been defined, measured and achieved in some cases [3], new approaches indicate that treatment goals should go beyond clinical stability, searching for functional recovery aiming to reducing disability and improving functional outcomes. Current research and treatment initiatives indicate that recovery in schizophrenia has been receiving increased attention [4,5].

Although, there is no overall agreement on the definition of recovery, clinical and functional outcome such as remission of symptoms and the ability to study, or work, should be considered as key elements of recovery [6]. The definition of recovery should include at least 2 domains, one referring to clinical remission and another related to social functioning outcome [7,8]. A pyramid has been considered to illustrate a three step recovery process. The first step, at the bottom, considers that maintaining stability might lead to Response to treatment. The second step includes improvements in functioning, life quality and cognition that might lead to remission. The third step, at the top of the pyramid, includes functional and social autonomy that might lead to recovery [9] (Figure 1).



Adapted from Weidenet al.1997

**Figure 1:** Functional recovery in schizophrenia

Other elements of recovery have been considered such as: psychotic symptoms, functioning, independent living in the community, cognitive capacities, competitive employment, social relations, physical health and certain aspects of quality of life [10]. Freedom of psychotic symptoms and relapse, satisfaction with daily activities, adequate functioning, keeping a job and an income, as well as social activities [11], living independently, holding a job or attending school, and self-managing medication [5].

Defining recovery has been a complicated issue since the word recovery means different things to different people. Recovery has been defined as: “the restoration or return to a former, usual, or correct state or condition, as health, prosperity, stability, etc...the cure of an illness, wound, etc” [12]. Or the “the ability to function in the community, at a social and vocational level and being free of the psychotic symptoms” [13]. According to the medical model, mental illness is a physical disease, and recovery refers to a return to a former state of health; therefore, functional recovery might indicate that the patient is cured [14]. Recovery, has also been defined as “a personal process of overcoming the negative impact of diagnosed mental illness/distress despite its continued presence” [15].

Basically, two approaches have been used to define recovery. The first approach reflects recovery as an outcome with the use of operationally defined criteria in different domains assessed at some point in time [16,17]. This indicates that people affected by the illness could learn the necessary skills to cope with their disabilities, so they can experience independent living and achieve relevant life goals [18]. The second approach refers to understanding recovery as an ongoing process where persons with this illness can have hope, empowerment, goal orientation and feel capable of having normal lives [18,19,20]. In this approach, recovery has been defined as “the deeply personal process of changing one’s attitudes, feelings, perceptions, beliefs, roles, and goals in life” [21], or as “the development of new meaning and purpose in one’s life, beyond the impact of mental illness [22]. These two approaches, one based on outcome and quantitative studies and the other on narrative and qualitative issues, can be considered complementary to each other to increase the understanding the complex phenomena of recovery [23].

However, it has been suggested that symptomatic remission, functional, and subjective components of recovery could not necessarily be linked to each other, so they should be assessed separately [24]. For instance, it has been found that symptom reduction does not necessarily lead to recovery [20]. In our everyday clinical practice we often see patients with no psychotic symptoms, suggesting that they have achieved symptomatic remission or clinical stability, but they do not show signs of recovery: they are unemployed, do not have money, no friends, and do not have an independent life. Contrary, another group of patients may continue to experience auditory hallucinations, but in spite of those voices, they have a job, earn a salary, have friends, a loving relationship, even children, live independently and might be very

functional.

Several attempts have been developed to measure recovery. The Stages of Recovery Scale (SRS) was developed to assess different aspects of recovery in Chinese patients with mental illness [25]. Recovery was examined among 75 Hong Kong patients with schizophrenia. Stages of recovery could be classified with reasonable accuracy: 75.50% for Stage 4 (living beyond disability); 75.45% for Stage 3 (living with disability). The combined stages 1 (overwhelmed by disability), and 2 (struggling with disability) did not predict recovery. Age and having a meaningful role were the best differentiators of recovery stag [26].

In Norway, “Fully recovered” has been defined using the following criteria: a reliable diagnosis of schizophrenia at the beginning of the illness; not fulfilling the criteria for the previous diagnosis; having been out of the hospital for at least three years; psychosocial functioning should be within a ‘normal range’, defined as greater than >65 on the Global Assessment Scale–GAF [27] and the patient should not be taking antipsychotic medication, or, if taking medication, it should be at a low dosage. Of the 6 patients who participated in this study, only three patients fulfilled the strict “Full recovery” criteria, one patient had a deteriorating course and two had a fluctuating course of the illness [28]. Maintenance of recovery was assessed in a 20-year follow-up study. Out of the six patients, that their diagnosis of schizophrenia was confirmed, two patients were still fully recovered, one patient was recovered, one was in remission, one had a deteriorating course of his illness, and one patient was deceased [17].

In the United States, Liberman et al. [16], proposed a definition of recovery for schizophrenia that includes 4 benchmarks that should be maintained for a least 2 consecutive years: symptom remission; full or part-time involvement in work or school; independent living; and peer relationships. These criteria were validated in a pilot study in 23 persons that were considered to have recovered from schizophrenia. As a result of this study and a literature review, ten factors were identified that appear to influence recovery (Table 1).

**Table 1:** Factors identified that appear to influence recovery (Liberman et al., 2002).

1. Family relationships; (i.e., support from caregivers, low expressed emotion in the family)
2. Absence of substance abuse
3. Shorter duration of untreated psychosis
4. Good initial response to neuroleptics (antipsychotic medication)
5. Adherence to treatment
6. Supportive therapeutic relationships (i.e., therapeutic alliance)
7. Good cognitive functioning
8. Absence of the deficit syndrome
9. Good premorbid history
10. Access to comprehensive, coordinated and continuous treatment

In Mexico, a one year, integrated treatment approach was implemented to achieve functional recovery for first-episode psychotic patients. Two components, symptomatic and functional remission, were assessed as indicators of functional recovery. The operational definition of functional recovery included the combination of symptomatic remission according to the Andreasen criteria [3], and functional remission according to the Torgalsboen criteria [28] with a GAF score above 65. At the end of treatment, patients of the integrated treatment approach showed a 94.9% of symptomatic remission compared to 58.8% of the control group. Functional remission was achieved by 56.4% of the integrated approach and 3.6% of the control group, 56.4% of the integrated treatment met both symptomatic and functional remission criteria and were considered recovered compared to 2.9% of the control group [29].

Another study was designed to examine the rates of symptomatic remission, psychosocial remission, global functioning and clinical global impression in a sample of chronic schizophrenia out-patients in order to assess functional remission and to identify predictive factors for functional remission. A total of 168 consecutive chronic Mexican outpatients receiving pharmacological treatment at the National Institute of Psychiatry in Mexico City were enrolled in a cross-sectional study. Symptomatic remission was assessed according with the definition and criteria proposed by the Remission in Schizophrenia Working Group [3]. Psychosocial Remission was assessed according with the Barack [30] criteria using the Psychosocial Remission Scale. Functioning was measured with the Global Assessment of Functioning, and clinical outcome with the Clinical Global Impression Scale. Results showed that 45.2% of patients fulfilled the symptomatic remission criteria, 32.1% achieved psychosocial remission and 53% reported adequate functioning. However, the combination of these three outcome criteria: symptomatic, psychosocial remission and functioning indicated that 14.9% of the patients achieved our pre-defined functional remission outcome. The logistic regression model included 5 predictive variables for functional remission: 1) being employed, 2) use of atypical antipsychotics, 3) lower number of medications, 4) lower negative symptom severity and 5) lower excitement symptom severity [31].

A systematic review and meta-analysis of recovery in schizophrenia that included 50 studies indicated that 13.5% met criteria the recovery criteria (8.1-20.0%). Recovery proportions were higher in countries with poorer economic status. The authors concluded that 1 in 7 individuals with schizophrenia fulfilled the criteria for recovery, and although significant changes in the treatment of schizophrenia have taken place in recent decades, the proportion of recovered patients has not increased [4].

A 15-year follow-up study with a sample of 274 patients in Chicago, attempted to discover if schizophrenia patients show intervals of recovery. Patients were assessed at multiple times during a 15-year period. Three operational criteria were required for recovery: 1) the absence of positive and negative psychotic symptoms, 2) adequate psychosocial functioning, that would

include paid full or part-time work, and 3) no psychiatric rehospitalizations during the follow-up year. Results indicated that over the 15-year period, 40% of schizophrenia patients showed 1 or more periods of recovery, 50% did not have a disorder that could be described as chronic and continuous, and most patients had some level of social functioning [32].

In the SOHO study, recovery was assessed in 6642 outpatients with schizophrenia under antipsychotic treatment during the three previous years. The definition of recovery included three components: symptomatic remission, functional remission and adequate quality of life that should be sustained for at least 2 years. Long-lasting symptomatic remission was achieved by 33% of subjects; long-lasting functional remission by 13%; and long-lasting adequate quality of life by 27%. All three recovery criteria were achieved by only 4% of the subjects [33]. Recently, recovery-oriented treatment for schizophrenia has received increased attention. Along with the development of pharmacological treatment strategies, a number of psychosocial interventions have been designed to enable schizophrenia patients to cope with the disabling aspects of their illness and achieve personal goals that might lead to recovery. Evidence indicates that antipsychotic medication alone is not sufficient for recovery. Therefore, psychosocial interventions are a necessary complement. Evidence-based practices that include improvements in pharmacological and psychosocial interventions [34-38] present a more favorable outcome for some of these patients by re-orienting treatment goals towards recovery. Current psychosocial strategies aim to help patients learning skills, thereby reducing disability and improving functional outcomes. Psychosocial treatments to promote functional recovery are available for persons suffering from schizophrenia. From a great array of psychosocial interventions, four are considered evidence-based: social skills training, cognitive behavioral therapy, cognitive remediation and social cognition training [36,39]. In addition, there are other treatments such as: assertive community treatment, supported employment, token economy interventions, integrated treatment, family base services, and family psychoeducation that have proven to be useful [37,40,41]. Treatment goals of these approaches might differ in their rationale, the selection of treatment targets, intervention methods and assessment instruments. However, all treatments pursue clinical and psychosocial improvements with a view toward recovery as their ultimate target. New approaches indicate psychosocial treatments as a necessary component of therapeutic success in schizophrenia [42,43,44].

To assess the beneficial effects of integrating pharmacological and psychosocial treatment on remission and functional outcome in outpatients with schizophrenia a clinical trial was carried out in 119 patients: 68 received antipsychotic medication, social skills training and family psychoeducation, and 51 received treatment as usual: antipsychotic medication. Patients were assessed at baseline and at 6-month follow-up. Results indicate that at the end of the study, 80% of the patients achieved the criteria for symptomatic remission: 62 patients (91.2%) of the social skills training group in comparison to 34 patients (66.7%) of the treatment as usual

group. Forty one patients (34.5%) accomplished the functional improvement criteria at the end of the study. Forty of these patients (58.8%) belonged to the social skills training group and one patient to pharmacological treatment alone. When criteria for symptomatic remission and functional improvement were combined, 39 patients (97.5%) of the social skills training group and one patient (1.9%) of the treatment as usual group achieved functional outcome. The results of this study emphasize the integration of pharmacological and psychosocial interventions to improve functional outcome in schizophrenia [45].

The Delphi study aimed to establish consensus about the meaning of recovery in psychotic patients. Two items were considered as essential for defining recovery: the achievement of a personally acceptable quality of life and feeling better about your-self. Other factors were considered as helpers of recovery: having a good, safe place to live, having the support of others, having a good understanding of your mental problems, knowing what helps you get better, knowing how to take care of yourself, and considering the positive things you have done. But also factors that show recovery such as: being able to find time to do the things you enjoy, or being able to ask for help when you need it, being able to trust yourself to make good decisions and positive changes in life, being able to take control of aspects of your life, being reasonable confident that you can manage your mental health [46].

Although there is no consensus on the definition on recovery, several definitions have been used to refer to recovery such as: recovery [16], full recovery [17], clinical recovery [47], functional recovery [48,25], functional remission, personal recovery [25], Recovery rates have been estimated reaching up to 68%. However, the majority of the studies on recovery are within a range between 4 and 20% (Table 2).

**Table 2:** Recovery rates in schizophrenia

Study	Patients who experienced recovery (%)
Morrison et al. 1973	20
Tsuang et al. 1979	46
Ciampi et al. 1980	33
Ogawa et al. 1987	57
Harding et al. 1987	46-68
Mala et al. 1996	10
Stephens et al. 1997	13
Tohen et al. 2000	38
Harrison et al. 2001	16.3
Harrow et al. 2005	41
Rosen et al. 2005	16
Lambert et al. 2006	26.6
Leucht et al. 2006	13

San et al. 2007	10.2
Schennach-Wolf et al. 2009	120
Novick et al. 2009	4
Bobes et al. 2009	27
Strauss et al. 2010	13
Lambert et al. 2010	21
Abdel-Baki et al. 2011	15
Ciudad et al. 2011	10-12
Albert et al. 2011	15
Robinson et al. 2012	21
Jaaskelain et al. 2012	13.5
Chang et al. 2012	17.4
Harrow et al. 2012	17-50
Cannavo et al. 2013	12
Prikyl et al. 2013	19
Valencia et al. 2014	10
Valencia et al. 2014	10-68
Valencia et al. 2015	14.9
Fervaha et al. 2015	14.9

It has been demonstrated that a considerable number of patients achieve symptomatic remission [13,49]. Research studies reported that remission rates vary within a range of 37-59% [38]; 20-60% [50], 17-88% [51]; and 17-78% [52]. Differences have been found in patients that achieved symptomatic and functional remission: 45% vs 10% [53]; 49% vs 17% [54]; 50% vs 20% [55]; 33% vs 21% [56].

In addition of remission and functional remission, community psychosocial functioning is another important issue related to recovery. Psychosocial functioning includes daily, social, work, school and family related activities in the community. It has been found that in schizophrenia patients there is a deterioration or failure to achieve adequate levels of social functioning. It has been estimated that about two-thirds of these patients are unable to accomplish to fulfill basic roles such as worker, parent, or spouse. Most of these patients have significant impairments in social relationships, are often isolated and frequently have significant problems in their community functioning [57]. Social functioning includes the capacity to engage in healthy social relationships [58]. Deficits in social functioning have been considered as a key feature in schizophrenia and correlated with social skills [59]. For a good number of patients, poor psychosocial functioning was a more debilitating issue than the presence of positive symptoms and there was a tendency to be resistant to medication after the illness had become chronic [60,61]. Certain issues such as role performance, daily activities, independent living, or real-world functioning have to be assessed to determine functional outcome. There has been

the tendency to redefining outcome measures in schizophrenia integrating social and clinical parameters [8,44]. However, this is a complicated issue because there is a lack of consensus on the convenient terminology that could be used to assess functioning [55,62]. Using the GAF, the variations of criteria when assessing functioning, good functioning or functioning within a normal range, that vary from 50 > [63]; >60 [17,44,64-71] >80 [53]; >81 [72];

A great number of studies have been carried out to identify predictor of remission in schizophrenia summarized as follows: younger age, shorter duration of illness, shorter length of current episode, being employed, lower PANSS general psychopathology and negative scales scores at baseline, and less suicidality [55]. A shorter duration of untreated psychosis, positive attitude toward pharmacotherapy during follow-up, antipsychotic monotherapy, better premorbid adjustment, and improvements of depression and of social cognition from baseline [53]. Baseline symptom severity and GAF scores, type of schizophrenia, and early treatment course [70], better premorbid adjustment [73], better functional level at baseline [33], lower psychopathology or illness severity at baseline [73,74,75] early symptomatic, functional or quality of life improvement, younger age, lower illness severity at baseline, better functioning level at baseline and early functional remission, early symptomatic and quality of life remission, and medication adherence [70], best premorbid social functioning, duration of psychotic symptoms before to entry, diagnosis, percentage of time taking antipsychotic medication and global cognition score and gender resilience [76], resilience, symptoms and family support [25].

Considering all this background where so much research has been done on these issues, we wanted to expand prior research and examine symptomatic remission and functional recovery in chronic ill patients with schizophrenia living in Mexico City.

The investigational objectives addressed in this chapter are: a) to examine the rates of symptomatic remission and the level of functioning in a sample of schizophrenia out-patients; b) to assess recovery as the result of patients fulfilling the criteria for recovery; c) to compare recovered versus non-recovered patients according to demographic and clinical variables; d) to identify predictive factors for recovery.

## **2. Material and methods**

### **2.1 Design and patients**

A descriptive, observational cross-sectional study was carried out. One hundred and ninety five schizophrenia out-patients who fulfilled the inclusion criteria were referred to the study protocol. Five patients refused to sign the written informed consent (three, indicated that it would be very inconvenient for them to participate in the assessments, since they were living far away from the hospital, and two, argued that they had no time to participate in the study).

A final sample of 190 patients was included in the study protocol. To participate in the study patients had to fulfill the following Inclusion criteria: a) 18 years of age or older; b) living in the community (including hostels, sheltered housing or living with relatives); c) diagnosis of schizophrenia according to DSM-IV criteria [77]; d) receiving treatment as usual which consisted of pharmacological treatment, for at least two years at the Schizophrenia Clinic of the Institute; e) not diagnosed with a severe and unstable medical disease; and f) cognitively able to give informed consent. The study was carried out at the Schizophrenia Clinic of the National Institute of Psychiatry in Mexico City. The Institute belongs to the Coordination of the National Institutes of Health and Hospitals of High Specialty of the Secretary of Health, Mexico. The Scientific Research Committee and the Ethics Committee of the Institute approved the study protocol.

## 2.2 Procedures

Three treating psychiatrists were in charge of checking patients' diagnoses as verified with their clinical chart. These psychiatrists were in charge of referring patients who fulfilled the inclusion criteria to the study protocol. Written informed consent was obtained after a detailed description of the study was provided to the participants and their relatives. Face to face interviews were conducted with all participants. Relatives were requested to participate during the interviews to corroborate in providing reliable information when patients were unable to respond to certain specific data during the interview such as age of illness onset, number and duration of psychiatric hospitalizations, length of hospitalization, time elapsed between the manifestations of the disease and seeking psychiatric help, etc. For all measures, reliable information was obtained from a consensus between patients, their corresponding relatives and their treating psychiatrists.

## 2.3 Measures

Symptomatic remission was assessed according to the criteria proposed by the Remission in Schizophrenia Working Group [3]. The definition of remission considers eight chosen items of the Positive and Negative Syndrome Scale (PANSS) [78] delusions (P1), conceptual disorganization (P2), hallucinatory behavior (P3), unusual thought content (G9), mannerism and posturing (G5), blunted affect (N1), passive/apathetic social withdrawal (N4) and lack of spontaneity (N6), that represent the core symptoms for schizophrenia that should score on a severity level ( $\leq 3$ ) of mild or less, each item scoring from 1=no symptom to 7=extremely severe symptoms. These criteria were utilized as the first requisite to achieve recovery.

Functioning was measured with the Global Assessment of Functioning (GAF) [27]. The GAF allows the rater to assess the combination of symptoms and psychological, social and occupational functioning on a scale from 1 to 100 using various levels of functioning: 1-10; 11-20; 41-50; 51-60, 91-100, etc. A total GAF score of  $\geq 60$  points was considered as

demonstrating good functioning [70].

Recovery was assessed using the criteria proposed by Liberman et al [16]. The fulfillment of these criteria should be for two consecutive years. The four criteria are described as follows:

- 1) Symptom remission: psychotic symptoms must be sustained as measured by the Positive and Negative Syndrome Scale [78] according to the Andreasen criteria, [3] described previously in the Measures section.
- 2) Vocational functioning: full or at least half time of successful employment or attendance in a school. If retired (e.g., over 60 years old), there should be an active participation in recreational, family or volunteer activities.
- 3) Independent living: indicates living independently on one's own, without daily supervision on issues such as: food preparation, personal hygiene, money management, self-administration of medication, etc. The patient could be living on his own, with a roommate, with a fiancée or with his/her family if that is considered culturally and age-appropriate. Includes cordial relations with his/her family, phone calls, visits and participation in family events.
- 4) Peer relationships: active participation in social and peer and recreational activities, phone conversations, social events at least once a week.

### **3. Statistical analysis**

All data were analyzed using the statistical software package SPSS version 20.0 for Windows P.C [79]. Demographic and clinical features were described using frequencies and percentages for categorical variables and with means and standard deviations (S.D.) for continuous variables. Chi-square ( $\chi^2$ ) analyses for contingency tables on categorical data and independent-samples t-Tests on continuous data were used for the comparison between recovered and non-recovered patients. Logistic regression analysis was performed with the backward-conditional stepwise selection method for the calculation of the likelihood that patients achieve recovery. Demographic and clinical features were included as explanatory variables in the model. The significance level for tests was established at  $p < 0.05$ .

## **4. Results**

### **a) Demographic and clinical features of the sample**

One hundred and ninety patients were included. Men accounted for 61.1% ( $n=116$ ) of the sample and the remaining 38.9% ( $n=74$ ) were women, with a mean age of 37.4 (S.D.=

10.7) years and a length of education of 12.2 (S.D.=3.4) years. Most of the patients were single (n=177, 93.2%) at the time of the study. More than half of the patients were unemployed (n=103, 54.2%). Many of them had a vocational activity, including remunerated employment (n=73, 38.3%), 6.3% (n=12) were currently studying and 1.1% (n=2) were receiving a retirement pension.

Paranoid schizophrenia was the predominant diagnosis among the sample (n=144, 78.8%), followed by schizoaffective disorder (n=19, 10%), delusional disorder and residual schizophrenia (n=7, 3.7%, each one), undifferentiated schizophrenia (n=6, 3.2%) and disorganized schizophrenia (n=4, 2.1%). The remaining diagnoses (simple schizophrenia, undefined psychosis and schizophreniform disorder) were present in only one subject per diagnosis. Age of illness onset was 23.2 (S.D.=7.7) years and the average age when the first specialized treatment with antipsychotics was received was at 24.8 (S.D.=8.1) years old. Therefore, more than half of the patients reported a duration of untreated psychosis (DUP) of a year or less (n=141, 74.2%), 38 (20%) patients between two and five years, and the remaining 11 (5.8%) between five and 21 years of DUP. Fifty-one (26.8%) patients reported previous drug use and 35.3% (n=67) reported excessive alcohol consumption.

More than half of the patients (n=122, 64.2%) reported being hospitalized at some point during illness evolution, with a mean of 2.3 (S.D.=2.2, range 1-15) hospitalizations. Hospitalizations lasted three months or less for the majority of the patients (n=115, 60.5%). At the time of their inclusion in the present study all patients were taking antipsychotic medication, 68.4% (n=130) with atypical antipsychotics and the remaining 31.6% (n=60) with typical antipsychotics. More than half of the patients (n=103, 54.2%) were currently using 1 or 2 medications (including antipsychotics). From the review of patients' clinical records, face-to-face interviews with the patient, and the clinician's perspective, 96.3% (n=183) had adequate treatment adherence, 6 patients (3.2%) had partial adherence and only one patient (0.5%) was non-adherent to treatment. Non-pharmacological treatment (psychosocial treatment, psychoeducation, psychotherapy) was reported by 116 (61.1%) patients, and family interventions in 42.1% (n=80) of the sample. The mean GAF score of the sample was 60.3 (S.D.=8.7) (Table 3).

**Table 3:** Demographic and clinical features between recovered and non-recovered patients.

	Functional Non-recovered patients n=170		Functional recovered patients n=20		Statistics
	n	%	n	%	
					$\chi^2$ , df, p
<b>Gender</b>					
Men	102	60.0	14	70.0	0.75, 1, 0.38
Women	68	40.0	6	30.0	
<b>Marital status</b>					
Single	160	94.1	17	85.0	2.33, 1, 0.12
Married	10	5.9	3	15.0	
<b>DUP</b>					
A year or less	127	74.7	14	70.0	0.20, 1, 0.64
More than one year	43	25.3	6	30.0	
<b>Antipsychotic</b>					
Typical	55	32.4	5	25.0	0.44, 1, 0.50
Atypical	115	67.6	15	75.0	
<b>Treatment adherence</b>					
No	6	3.5	1	5.0	0.10, 1, 0.74
Yes	164	96.5	19	95.0	
<b>Previous psychiatric hospitalization</b>					
No	60	35.3	8	40.0	0.17, 1, 0.67
Yes	110	64.7	12	60.0	
<b>Length of hospitalizations</b>					
Three months or less	103	93.6	12	100	0.81, 1, 0.36
More than three months	7	6.4	-	-	
<b>Non-pharmacological treatment</b>					
No	65	38.2	9	45.0	0.34, 1, 0.55
Yes	105	61.8	11	55.0	
<b>Family interventions (psychotherapy)</b>					
No	97	57.1	13	65.0	0.46, 1, 0.49
Yes	73	42.9	7	35.0	
	<b>Mean</b>	<b>S.D</b>	<b>Mean</b>	<b>S.D</b>	<b>t, df, p</b>
<b>Age (years)</b>	37.5	10.9	36.7	9.5	0.33, 188, 0.74
<b>Length of education (years)</b>	12.1	3.3	13.2	3.8	-1.34, 188, 0.18
<b>Age of illness onset (years)</b>	23.0	7.7	25.0	7.5	-1.09, 188, 0.27
<b>Age 1st antipsychotic treatment (years)</b>	24.5	8.1	27.2	7.4	-1.41, 188, 0.16
<b>Number of current medications</b>	2.4	1.1	2.0	1.2	1.74, 188, 0.08
<b>Number of psychiatric hospitalizations</b>	2.4	2.2	1.9	1.0	0.72, 120, 0.47
<b>GAF score</b>	58.8	7.1	72.7	11.3	-7.69, 188, <0.001

### b) Recovery: required criteria according to Liberman and Kopelowicz

From this sample, 48.4% (n=92) patients met the criteria of symptomatic remission, followed by 46.3% (n=88) who met the criteria of vocational functioning, 26.3% (n=50) for

peer relationships, and independent living was met by only 23.7% (n=45) of the patients. From these criteria, a total of 10.5% (n=20) of the patients were considered to have attained recovery as they met the four required criteria, the remaining 89.5% (n=170) of patients did not fully meet recovery criteria.

### c) Demographic and clinical characteristics between recovered and non-recovered patients

Both groups exhibited similar demographic and clinical features, with the exception of the GAF score, in where recovered patients exhibited higher scores than non-recovered patients. The results of the comparison between groups are shown in Table 2; the comparison of vocational activity was not performed as it is one of the required features for recovery.

### d) Predictors of recovery

All variables used in the comparison analyses were included in the logistic regression model to determine the predictors of recovery. All dimensional variables were classified in auxiliary variables through a *dummy codification* to perform this analysis. The variables were represented by two values, “0” or “1” based on the mean value of the dimensional variable, where the value “1” was considered the risk/present value. For example, the mean value for age of illness onset was represented as “1/present” if the reported age was  $\geq 23$  years, and as “0/absent” if the age was less than 23.

The logistic regression equation with the backward-conditional stepwise selection was capable of correctly classifying 91.6% of the cases. The equation was generally more exact on predicting non-recovered patients (98.2%) than the recovered ones (35.0%). This model was significant according to the statistical value of Hosmer & Lemeshow ( $p=0.93$ ) [80] and predicts 45.4% of the phenomenon variation. The logistic regression model included 2 predictors for recovery: 1) increased age of illness onset ( $\geq 23$  years old) and, 2) better functioning according to a higher GAF score ( $\geq 60$  points) (Table 4).

**Table 4:** Logistic regression model for recovery.

Variable	$\beta$ Coefficient	Standard Error	Odds Ratio	C.I. 95%	P
Fewer psychiatric medications	0.98	0.67	2.67	0.71 – 10.0	0.14
Increased age of illness onset	1.42	0.65	4.16	1.16 – 14.94	0.02
DUP $\leq 1$ year	1.22	0.69	0.29	0.07 – 1.13	0.07
Higher GAF score	0.17	0.03	1.19	1.14 – 1.27	<0.001

## 5. Discussion

The main aims of our study were to explore the rates of symptomatic remission, to measure global functioning, and assess recovery as the result of patients fulfilling the criteria for recovery in a sample of chronic schizophrenia out-patients, to compare recovered versus non-recovered patients according to demographic and clinical variables, and to identify predictive factors for recovery. The logistic regression model included two predictors of recovery: 1) increased age of illness onset ( $\geq 23$  years old) and, 2) better functioning according to a higher GAF score ( $\geq 60$  points). These predictors have been reported by [33,53,70,73].

If we consider the percentages of remission and recovery rates reported in a great number of studies, we conclude that the results of the present study are within the range of remission and recovery rates. Achieving recovery in our sample was 10.5%. Research indicates that only 20% of patients recover on both clinical and social parameters [8]. It is worth noticing that in a previous cross-sectional study in chronic Mexican patients with schizophrenia, 14.9% achieved the predefined functional definition that was a combination of three outcome criteria: symptomatic remission, psychosocial remission and functioning [31]. We conclude from these two previous studies, that recovery in chronic schizophrenia Mexican patients is not higher than 15%. The clinical relevance of this study indicates that Mexican schizophrenia patients have the potential of achieving recovery. We could consider recovery as a real challenge that might allow us to re-evaluate our goals and expectations for our patients proposing the creation of recovery units where we can work the recovery process that might help patients and their relatives to live better and meaningful lives. Considering the characteristics of the present study, limitations could be mentioned such as: we did not assess symptom and recovery improvements, neither follow-up of the participants. We measured the exposure of these variables at one moment in time. We did not analyze the impact of antipsychotics. The efficacy of antipsychotics was out of the scope of the study.

In addition to the four required criteria to achieve recovery [16], we should mention two issues that play a relevant role in the recovery process of persons suffering from schizophrenia. The first one refers to the importance of the maintenance medication which is a very good predictor of symptomatic remission and recovery. When patients are taking their medication, they are more likely to be clinically stable. Remitted patients usually achieve clinical stability, and have a higher level of psychosocial functioning that might lead to recovery. When there is no compliance with medication there might be a risk of relapse, and relapse rates are very high. Therefore, the role of maintenance medication is a relevant issue for facilitating recovery. The second consideration is the role of the family in the recovery process. When family members, either living or not living with their ill relatives, provide emotional and instrumental support, it is more conducive to recovery [25]. Family participation is important during the recovery process as families can learn skills about how to deal with the illness, about medication management, and recognition of warning signs of relapse. Family strengths and resources

can be utilized to improve communication as well as family relationships. Family members in addition of their multiple needs and problems they have to solve, they also have to face caregiving responsibilities; therefore, they should stay healthy and strong in order to support their ill relative. Different types of family interventions have been found to be effective in reducing exacerbations in schizophrenia improving social functioning and reducing family burden [81]. Therefore, family members can be useful in the recovery process.

In terms of future directions, a scientific agenda for the study of key issues on recovery should include the following: a) differences in the various definitions of recovery and their studying processes and outcome on recovery; b) propose key research questions; c) the implications of data on research outcome studies that would allow us to understand to what extent recovery might be a reachable goal for the majority of schizophrenia patients; c) factors that facilitate recovery and methods for studying these issues; d) to consider how to foster recovery-oriented treatment [19].

The treatment of schizophrenia has experienced considerable changes moving from expectations that were limited to the control of aggressive behaviour and psychotic symptoms, to the use of modern treatment strategies that allows patients to live successfully in the community. Recovery can be considered as a complete absence of the disease or as a return to normal functioning when patients have learned to cope with their illness, recognize their limitations, and set their goals to search for a meaningful life.

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