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Social functioning in first-episode schizophrenia. A prospective follow-up study

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SUMMARY

Aim: was to compare social functioning of first-admitted schizophrenic patients with healthy controls and evaluate the influence of different variables on social abilities of patients, 1 month (T1), 13 months after hospitalization (T2) and 4–6 years after T1 (T3).

Material and methods: A group of 74 schizophrenic patients: 46 male and 28 female; age 24.7 $\pm$ 6.7 and a control group of matched 52 male and 34 female subjects were enrolled. Social Functioning Scale (SFS), Positive and Negative Syndrome Scale (PANSS), Global Assessment Scale (GAS) and socio-demographic questionnaire were used.

Results: In all examinations SFS scores in the patients (T1- 103.5; T2- 104.4; T3- 107.0), were significantly lower than in the healthy controls- 117.0 ($p<0.001$). In longitudinal analysis, a mild improvement was observed in T3 SFS score and in its three subscales ($p<0.05$) In cross-sectional analysis, better social functioning was associated with female sex, longer education, activity before admission, and better functioning in the pre-admission period. In regression analyses SFS at T2 was predicted by PANSS total scores at T1 (27% of the variance), and at T3 by PANSS total scores at T1 and duration of psychotic symptoms before the first hospitalization (20% of the variance).

Conclusions: Social functioning in schizophrenia is impaired from the onset of disease and may be mildly improved in intermediate follow-up. Female sex, higher education and pre-admission functioning are correlated with better social outcome, however regression analysis point to the duration of untreated illness and severity of symptoms after the first admission, as important predictors of social functioning in early course of schizophrenia.

social functioning / **schizophrenia** / **first-episode** / **follow-up study**

INTRODUCTION

Both DSM-IV and ICD–10 classifications [1, 2] contain impairment in social functioning, as an essential feature of schizophrenia. Patients with this diagnosis usually are not able to maintain close relationships, occupational functioning, community activity, and self-care. Moreover, introduction of an atypical antipsychotic with a relatively lower number of side-effects does not lead to significant differences in social functioning in schizophrenia patients treated with typical antipsychotic in comparison to those treated with atypical drugs [3].

Patients with long-duration of schizophrenia show significant impairment of social functioning, although in such a group, it is difficult to

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differentiate the impact of illness, and concomitant factors such as medications, from a primary dysfunction, which may be associated with the pathogenic process [4, 5]. However, finding significant impairments in first-episode patients may suggest that the deterioration occurs before or at the onset of illness.

Several cross-sectional studies suggest that there are no significant differences in social functioning between first- and multiple-episode schizophrenia patients [6]. However classical psychopathological descriptions point to the significant clinical deterioration in the first 5 years of schizophrenia [7]. A longitudinal, prospective study design allows observing if there are any changes of social functioning, and this may help in elucidating the above discrepancy.

The severity of current psychopathological symptoms may affect social abilities of patients with schizophrenia [8, 9], and most studies indicate the role of negative symptoms in this regard. Dickerson et al. [4] reported that social functioning is associated both with negative symptoms and poor neurocognitive functions. Other studies point to the role of other socio-demographic and clinical factors, which may also affect the level of social functioning [10, 11].

The purpose of this study was to compare social functioning in first-episode schizophrenia patients, 1 month after a hospitalization, 13 months, and 4–6 years after the first examination. We also evaluated the influence of several factors (basic socio-demographic variables, risk and pre-hospitalization factors, factors connected with the hospitalization period, symptoms and social support) on social functioning of the patients.

MATERIAL AND METHODS

Patients and controls

Ninety six patients were qualified for the study after hospitalization due to the first episode of psychosis. At discharge, all the study subjects met the diagnostic criteria for schizophrenia (ICD–10, F20). The inclusion criteria were: no alcohol or drug abuse, no mental retardation, no organic brain diseases, no severe physical disorders, and an ability to cooperate in a research interview. The diagnosis was made by two clinicians and confirmed by a senior researcher. All the patients signed the informed consent for the study. During the first and third assessment 14 patients dropped – out, resulting in the final group of 74 subjects: 46 male and 28 female; age 24.7 ± 6.7 (range 16–47) (Figure 1). Comparison between the 74 patients who participated at the three time points of the study with those who dropped-out between the baseline assessment and Time 3 (n = 22) showed no significant differences with regard to sex, age at first hospitalization, marital status, level of education, duration of psychotic symptoms before the hospitalization, living environment and psychopathological status at Time 1.

A control group comprised 86 psychiatrically healthy subjects: 52 male and 34 female matched according to age.

Psychometric measures

Social Functioning Scale (SFS) is a 79-item questionnaire, developed and validated on out-

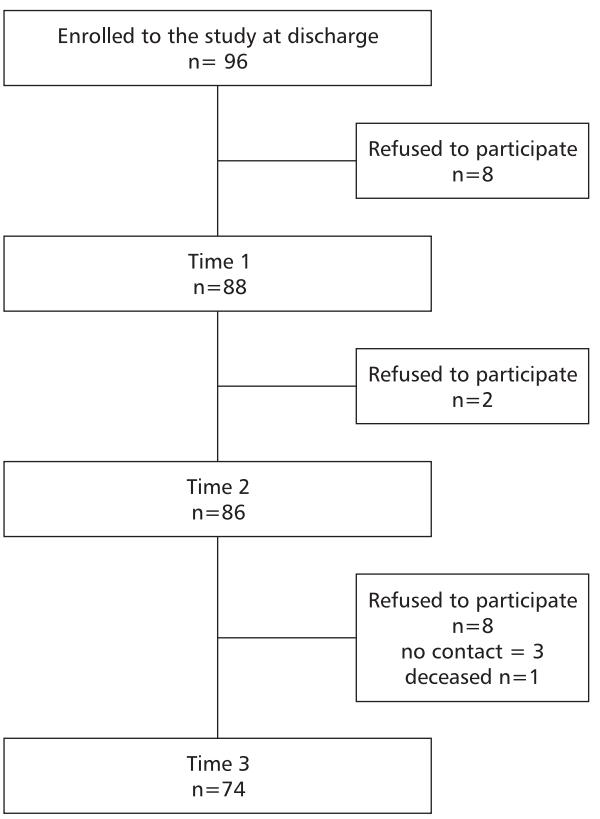

Fig. 1. The flow – chart of the participants.

patients with schizophrenia [12]. The questionnaire asks the patient about performance in seven areas: Social Engagement (SE), Interpersonal Communication (IC), Recreational Activities (RA), Social Activities (SA), Independence Competence (INC), Independence Performance (IP) and Occupational Activity (OA). The purpose of the scale is to provide an evaluation of strengths and weaknesses of patient functioning, and it may reveal aims for therapeutic intervention. Recently, the scale was also used as an outcome measure in schizophrenia. The self-report questionnaire was administered by the verbal interview to both the patients and the caregivers. Due to lack of significant differences in the patients' and caregivers' assessment, in further analyses we used only the patients' assessment. SFS was previously translated into Polish and validated [13].

Positive and Negative Syndrome Scale (PANSS) includes a structured interview to assess the patients on 30 items covering positive, negative and general symptoms [14]. For each item, ratings are made on a 1–7 scale of symptom severity.

Premorbid functioning was assessed with the Global Assessment Scale (GAS). GAS is the standard method used to assess the clinician's judgment of a patient's overall level of functioning [15]. We assessed the most severe disturbances of functioning 1-year before the first admission.

Current social support was assessed with 1 question: "Are you satisfied with social support?" which was rated with the 1–5 Likert scale (1= not satisfied at all; 5= very much satisfied).

A structured interview was used to gather information about:

a. Socio-demographic variables: age, sex, activity before onset of illness.
b. Risk factors: family history of psychiatric disturbances in 1st and 2nd degree relatives, comorbid somatic illnesses.
c. Pre-hospitalization factors: age at onset of problems with functioning, duration of psychotic symptoms.
d. Factors connected with the hospitalization period: age at the first hospitalization, duration of first hospitalization.

Study design

We performed three assessments of social functioning (SFS) symptoms (PANSS), and social support in patients' community, 1 month (T1), 13 months (T2) after hospitalization and 4–6 years after T1 (T3). Also at T1, the patients were asked about their socio-demographic and clinical characteristics and then all the information received was verified during the interview with the caregivers and by analysis of the notes included in the patients' medical records.

The protocol of the study was accepted by the Bioethical Committee of Poznan University of Medical Sciences.

Statistical analyses

Student t-test for independent data was used to compare results of the patients and the controls. ANOVA for repeated measures was performed to compare the first, second and third examination of social functioning in the patients. Student t-test for independent groups, ANOVA and Spearman's rank correlation coefficient was used to assess relationships between socio–demographic, clinical variables and SFS score in T1, T2 and T3. Finally, we performed multiple stepwise forward regression analyses to determine predictive value of the baseline socio–demographic variables (sex, education, activity before onset of illness), risk factors (family history of psychiatric disturbances, comorbid somatic illness), pre-hospitalization factors (age at onset of problems with functioning. duration of psychotic symptoms, pre-hospitalization functioning according to GAS), factors connected with the hospitalization period (age at the first hospitalization, duration of first hospitalization), and PANSS total score at T1. P value <0.05 was accepted as statistically significant.

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RESULTS

The study sample consisted of predominantly male (62.0 %) and young patients (66.2% were

below 24 years of age). Female patients at the first admission were older than male (mean difference 3.0 years, $p<0.05$). The majority of the patients lived in a city (77.0%). Until the first admission 51.4% of the patients had higher education, and 5.4% had academic education. During the observation period the number of the patients with higher and academic education increased by 8% respectively. Until the first admission 12.2% of the patients were married. Between T1 and T3, the number of those married increased by 4%. There was 1 divorcee. Some form of activity was reported by 62.2 % of the patients before the admission, 24.3% of the patients worked, 37.7% studied. At T3 the number of active persons decreased; 26% of the subjects quit from their job or school. In T1, T2 and T3 social support was rated as good by 71%, 72% and 72% respectively. The patients were treated under naturalistic conditions. The majority of them received antipsychotic treatment (between T1 – T2: 95.5% and between T2 – T3: 90.5%). Most of the patients were treated with second generation antipsychotic drugs (between T1 – T2: 67.2% and between T2 – T3: 68.9%).

At T1 and T2 SFS assessments, we found similar levels of social functioning (T1 – 103.5; T2 – 104.4), ranges respectively: 70.5 – 126.4; 77.4 – 127.4. In T3, the SFS increased to 107.0 (79.7 – 131.4), which was statistically significant difference (overall ANOVA, $p=0.02$). Results in subscales of SFS were presented in Table 1. In healthy controls, the SFS score was 117.0 (range 98.6 – 130.1). The difference between the results of patients and healthy controls was significant for global assessment ($p<0.001$) and each subscale of SFS both in T2 and T3, except the SA subscale in T3 (results shown in Table 1).

Relationship between socio-demographic factors and SFS score

Sex

Female patients scored significantly higher in IP than male: T1 – 98.5 (±14.9) vs. 90.1 (±14.8), $p<0.05$; T2 – 99.8 (±13.5) vs. 89.2 (±14.1), $p<0.01$; T3 – 107.9 (±16.6) vs. 95.8 (±13.8), $p<0,001$.

Education

Education level was divided into 2 categories: category 1: basic (≤8 years) and job-related (8–10 yrs); and category 2: higher (11–13 yrs) and academic (14 and more years). The results for the patients with the two levels of education

Table 1. Comparison of social functioning in schizophrenia patients measured with Social Functioning Scale 1 month and 13 months after the hospitalization, and the score of healthy control subjects

	SFS T1 Mean (SD)	SFS T2 Mean (SD)	SFS T3 Mean (SD)	F	P	SFS in healthy controls	t (patients' T2 vs. controls)	t (patients' T3 vs. controls)
SFS total	103.5 (11.4)	104.4 (10.6)	107.0 (12.4)	4.3	0.02	117.0 (6.6)	8.9***	6.3***
SE	104.0 (11.1)	105.6 (12,3)	106.3 (12.8)	1.0	0.38	114.0 (10.8)	4.7***	4.3***
IC	109.2 (19.3)	112.3 (18.6)	116.6 (19.5)	4.7	0.01	130.1 (15.5)	6.6***	4.8***
SA	102.8 (15.1)	103.3 (14.0)	107.2 (17.5)	3.6	0.08	119.9 (10.9)	8.5***	5.4***
RA	98.8 (15.6)	99.8 (14.0)	107.9 (17.4)	9.4	0.001	111.0 (13.5)	5.1***	1.3
IP	93.3 (15.3)	93.2 (14.8)	100.4 (15.9)	11.3	0.001	106.6 (12.0)	6.1***	2.5**
INC	108.3 (14.1)	109.1 (14.2)	108.0 (14.9)	0.2	0.8	116.3 (9.1)	3.8***	4.1***
OA	109.1 (13.9)	107.9 (13.4)	103.9 (13.2)	5.2	0.006	122.3 (1.7)	9.2***	11.9***

*** $p < 0.001$; ** $p < 0.01$

Social Functioning Scale (SFS), Sub-scales: Social Engagement (SE), Interpersonal Communication (IC), Recreational Activities (RA), Social Activities (SA), Independence Competence (INC), Independence Performance (IP) and Occupational Activity (OA).

Table 2. Level of education and social functioning in first-episode schizophrenia. Independence performance (IP), Occupational activity (OA), Social engagement (SE), Recreational activity (RA).

Level of education	N	T2 Mean (SD)	N	T3 Mean (SD)
		Global SFS score		Global SFS score
Basic/ Work-related	30	105.9 (9.9)	26	101.0 (13.9)
Higher/ Academic	44	106.8 (10.5)	48	110.3 (10.3)
		$p<0.05$		$p<0.01$
		IP		IP
Basic/ Work-related	30	89.7 (16.3)	26	93.8 (16.6)
Higher/ Academic	44	95.7 (14.2)	48	104.0 (14.6)
		$p<0.05$		$p<0.01$
		OA		OA
Basic/ Work-related	30	103.0 (13.4)	26	103.0 (13.4)
Higher/ Academic	44	111.3 (12.5)	48	111.3 (12.5)
		$p<0.01$		NS
		SE		SE
Basic/ Work-related	30	104.5 (10.0)	26	100.3 (11.7)
Higher/ Academic	44	106.5 (13.6)	48	109.5(12.3)
		NS		$p<0.01$
		RA		RA
Basic/ Work-related	30	96.6(14.5)	26	102.2 (18.2)
Higher/ Academic	44	102.0(13.4)	48	110.9 (16.3)
		N.S.		$p<0.05$

differed significantly in T2 and T3. The patients with higher and academic education scored significantly better than the patients with lower level of education (Table 2).

Activity before onset of illness

Patients who were occupationally or educationally active before the hospitalization scored significantly better in Occupational Activity than the subjects who have not engaged in any kind of premorbid activity in T1 – 112.0 (±13.5) vs. 104.2 (±13.2), ($p<0.05$) and T2 – 110.5 (±13.1) vs. 103.6 (±13.1), $p<0.05$).

Relationship between risk factors and SFS score

Family history of psychiatric disturbances

Family history was not associated with social functioning. In all examinations, the SFS results were similar both in the group of patients with (n = 34) and without (n = 40) family history.

Comorbid conditions

Patients with comorbid conditions (n = 32) scored significantly lower in global SFS and 4 subscales: SFS global (T2 – 106.5 (±10.8) vs. 101.7 (±9.7) and T3 – 110.0 (±10.1) vs. 103.1 (±14.1), $p<0.05$); OA (T1 – 112.0 (±13.9) vs. 105.2 (±13.0), T2 – 112.1 (±13.1) vs. 102.3 (±11.8) and T3 – 106.5 (±12.3) vs. 104.4 (±13.7), $p<0.05$; IP (T3 – 103.6 (±14.8) vs. 96.1 (±16.5), $p<0.05$; INC (T3 – 112.1 (±12.4) vs. 102.7 (±16.3), $p<0.01$.

Relationship between pre-hospitalization factors and SFS score

Age at onset of disturbances of functioning

There was a positive correlation between SFS scores and age at onset of disturbances of functioning. Patients with later onset scored higher in global SFS score at T1 ($r = 0.36$, $p<0.01$) and its 3 subscales: RA (T1 – $r= 0.24$, $p<0.05$), IP (T1 – $r = 0.26$, $p<0.05$), IC (T3 – $r = 0.24$, $p<0.05$).

Duration of psychotic symptoms

Longer duration of psychotic symptoms before the first hospitalization was correlated with lower scores in total SFS and subscales: SFS (T1 – $r = –0.35$, $p<0.01$; T2 – $r = –0.24$, $p<0.05$; T3 – $r = –0.47$, $p<0.01$), SE (T1 – $r = –0.33$, $p<0.01$; T3 – $r = –0.32$, $p<0.01$), IC (T1 – $r = 0.32$, $p<0.01$; T3 – $r = –0.33$, $p<0.01$), SA (T1 – $r = 0.29$, $p<0.05$; T3 – $r = –0.40$, $p<0.01$), RA (T3 – $r = –0.32$, $p<0.01$), IP (T3 – $r = –0.29$, $p<0.05$), INC (T1 – $r = –0.25$, $p<0.05$; T3 – $r = –0.44$, $p<0.01$), OA (T1 = –0.37, $p<0.01$; T2 – $r = –0.24$, $p<0.05$; T3 – $r = –0.42$, $p<0.01$).

Pre-hospitalization functioning

In all examinations, there was a positive correlation between GAS score, which refers to 1-year before hospitalization, and Occupational Activity: T1 – $r = 0.34$ ($p<0.01$), T2 – $r = 0.31$ ($p<0.01$), T3 – $r = 0.24$ ($p<0.05$). Also, a significant correlation between GAS and SFS 3 total score was observed – $r = 0.23$ ($p<0.05$).

Relationship between hospitalization factors and SFS score

Age at the first hospitalization

At T1 patients younger (≤ 20) at the time of first hospitalization scored lower in all SFS subscales, however the difference was insignificant. In Occupational Activity subscale they scored significantly higher: 115.8 (±10.8), $p <0.05$. The same picture was observed at T2 (lower scores in all SFS subscales vs. higher scores in OA). An opposite trend was noticed at T3. Patients younger at the time of first hospitalization scored higher in all SFS. Statistically significant difference was found in SFS total (112.6, ±13.0 vs. 105.5, ±11.9, $p<0.05$), SA (116.2, ±17.5 vs. 104.8, ±16.8, $p<0.05$), RA (115.6, ±19.6 vs. 105.8, ±16.3, $p<0.05$).

Duration of first hospitalization

Duration of the first hospitalization was significantly related to social functioning. Hospitalization lasting 4 months or less was associated with better score in global SFS (T1: 104.8, ±10.1 vs. 93.5, ±15.1, $p<0.05$; T2: 105.7, ±9.7 vs. 95.2, ±12.6, $p<0.05$), and in several subscales (T1: SE, INC, OA; T2: RA, IP, INC, OA).

Factors assessed simultaneously with SFS

Psychopathological symptoms

In all assessments, every SFS subscale and SFS global score was highly negatively correlated with the current PANSS score: T1: $r = –0.63$, T2: –0.53, T3: –0.74 ($p<0.01$). Also, the PANSS T1 score was significantly correlated with SFS in T2 ($r = –0.53$, $p<0.01$) and T3 ($r = –0.40$, $p<0.01$).

Social support

We observed a significant correlation between the rating of social support and the global SFS score and 5 of its subscales. Results were shown in Table 3.

Regression analyses

Results of the regression analysis between SFS and basic socio-demographic factors, risk factors, factors connected with pre-hospitalization and hospitalization, and PANSS at T1 were presented in Table 4. Global SFS at T2 was predicted by PANSS (27% of the variance) and at T3 by PANSS and duration of psychotic symptoms (20% of the variance). The same factors appeared to be the

Table 3. Correlation between concurrent social support and social functioning in T1, T2 and T3.

	Social support T1	Social support T2	Social support T3
	r	r	r
SFS global	0.28*	0.41**	NS
SE	NS	0.24	NS
IC	0.29*	0.38**	0.25*
SA	0.33 **	0.28*	0.27*
RA	NS	0.28*	NS
IP	0.26*	0.39**	NS
INC	NS	0.29*	NS
OA	NS	NS	NS

**$p < 0.01$; *$p < 0.05$

most important also in the majority of the SFS subscales.

DISCUSSION AND CONCLUSIONS

This study is a continuation of longitudinal observation of the first episode schizophrenic patients [16]. The major advantage of this project was to re-assess social functioning in schizophrenia patients 4–6 years after an index episode, which is traditionally considered as a period of significant clinical deterioration [17].

Despite this, the results of this study may suggest that social functioning in schizophrenia is relatively stable in 1-year follow-up, and except the occupational activity, may show mild improvement in 4–6 years of observation. The most probable explanation of these results would be a slow and gradual adaptation of the patients to the situation associated with the illness. Several socio-demographic variables showed association with social functioning in both prospective assessments; however the most important determinants of social functioning in 4–6 years of follow-up were severity of symptoms in T1 and duration of psychotic symptoms.

Our previous observation [16] and other studies [6] indicate, that deficits in social functioning are present from the onset of the illness and remain stable in the short-term follow-up, which suggest, that they are not associated with long duration of the illness. This is confirmed by our intermediate follow-up (4–6 years) of the patients with schizophrenia, where we found mild improvement of social functioning.

In cross-sectional analysis we found that females with the first-episode schizophrenia score significantly better in Independence Performance (T1, T2 and T3) than males. This confirms that a favourable outcome in female patients [17, 18] can be observed not only in short, but also in the intermediate follow-up period. Several biological and psychosocial explanations of this phenomenon have been proposed, such as an earlier onset and higher risk of staying single in males, protective effect of oestrogen, and better pharmacotherapeutic outcome in females.

We found the significant relationship between the level of education before admission and social functioning – the patients with longer education scored significantly better than the patients with shorter education in T2 and T3. Better education probably enables the patient to retain some social roles.

Active role fulfilment before hospitalization was associated with better Occupational Activity in T1 and T2. The patients with better functioning one year before hospitalization (GAS score) obtained better results in Occupational Activity score in T2 and T3 than the patients with impaired functioning in the preadmission period. GAS score showed moderate correlation with global SFS score in T3, similarly as in the previous assessments [16]. We cannot exclude that a low GAS score in the preadmission period was caused by the presence of negative symptoms.

Several other factor such as presence of comorbidities, age at onset of disturbed functioning, duration of psychotic symptoms before hospitalization were correlated with social functioning in T3, which essentially confirm our previous results of short term follow-up [16]. The better social outcome in T3 was observed in patients younger at hospitalization, however opposite association was observed in T1 and T2. This difference may be related to the fact, that age at the first hospitalization results from both earlier onset of disorder and shorter duration of untreated illness.

Self-assessment of satisfaction with social support was significantly correlated with social functioning in the patients with schizophrenia in T1 and T2; however this association was not signifi-

Table 4. Multiple regression analysis of SFS T2 and SFS T3 score with socio-demographic and clinical factors as independent variables. Social engagement (SE), Interpersonal communication (IC), Social activity (SA), Recreational activity (RA), Independence: performance (IP), Independence: competence (INC), Occupational activity (OA)

SFS	Factor	beta	% of explained variance	F
SFS T2 Total	PANSS T1	–0.52	27	26.4***
SE	Age at the first hospitalization	0.28	13	6.5**
	PANSS T1	–0.27		
IC	PANSS T1	–0.38	13	12.3***
SA.	PANSS T1	–0.41	16	14.7***
RA	PANSS T1	–0.32	10	8.3**
IP	PANSS T1	–0.36	23	11.9***
	Sex	–0.29		
INC	PANSS T1	–0.44	18	17.3***
OA	PANSS T1	–0.36	27	10.0***
	Comorbidity	–0.27		
SFS T3 Total	PANSS T1	–0.31	20	10.5***
	Duration of psychotic symptoms	–0.30		
SE	PANSS T1	–0.29	7	6.6*
IC	PANSS T1	–0.33	10	9.2**
S.A.	Duration of psychotic symptoms	–0.35	11	10.1**
RA	Duration of psychotic symptoms	–0.34	10	9.2**
IP	PANSS T1	–0.37	25	13.1***
	Sex	–0.31		
INC	Duration of psychotic symptoms	–0.30	18	9.0***
	PANSS T1	–0.28		
OA	Duration of psychotic symptoms	–0.36	11	10.4**

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

cant in T3. This may indicate that subjective perception of social support plays an essential role only in first stage of schizophrenia, whereas later more objective predictors, such as severity of symptoms predominate.

In every stage of the assessment (T1, T2 and T3), the SFS score was significantly related to the severity of concurrent psychopathological symptoms (PANSS score). Such an observation was repeatedly reported by others [4, 8, 9, 12]. Moreover, we observed that social functioning in short and intermediate follow-up is related to the severity of schizophrenia symptoms directly after the hospitalization (PANSS – T1).

In multiple regression analysis, which included all the analyzed variables, SFS T2 was predicted only with T1 PANSS score and SFS T3 was predicted with T1 PANSS and duration of psychotic symptoms. These results may suggest that in the 4–6 years follow-up of index episode of schizophrenia, the most important predictive factors are: duration of un- or under-treated psychotic symptoms before hospitalization and presence of psychopathological symptoms after discharge from hospital.

There are some shortcomings in this study. The generalizability of the findings may be limited by the fact that the study sample was obtained primarily from hospitalized patients whose symptoms may have been be more severe than in outpatients, and by a relatively large number of non-participants who might have been more severely ill than the participants.

Nevertheless, this study allows drawing some conclusions. Significant disturbance of social functioning can be observed in schizophrenic patients after 4–6 years of follow-up, however it does not increase from 1-year follow-up and index hospitalization. Some protective role in social functioning may be played in the person being female sex and having higher education, however their importance is limited in regression analyses. Social functioning predominantly depends on the severity of symptoms directly after discharge and duration of untreated psychotic symptoms. These results may indicate that an improvement of social outcome in schizophrenia is possible; however it is associated with accomplishment of two challenging aims. They comprise shortening of a period of untreated psychosis and achieving possibly best remission after the treatment of the first psychotic episode.

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