

The Effects of Psychosocial Skills Training on Symptomatology, Insight, Quality of Life, and Suicide Probability in Schizophrenia

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Abstract

Objective: The aim of this study was to determine the effect of psychosocial skills training (PST) on symptomatology, insight, quality of life, and suicide probability in patients with schizophrenia.

Method: The sample consisted of 22 schizophrenic outpatients diagnosed according to DSM-IV diagnostic criteria. Three PST groups were formed and each group's training lasted approximately 6 months. Nineteen (86%) patients completed the study. The Scale for the Assessment of Positive Symptoms, Scale for the Assessment of Negative Symptoms, Calgary Depression Rating Scale for Schizophrenia, Schedule for Assessing the Three Components of Insight, Quality of Life Scale for Patients with Schizophrenia, and Suicide Probability Scale were administered to the patients before and after PST.

Results: At the end of the study mean score for the Scale for the Assessment of Positive Symptoms score (baseline 8.5 ± 9.9 , post-PST 3.4 ± 6.0 , $P = 0.004$), Scale for the Assessment of Negative Symptoms (baseline 33.7 ± 19.3 , post-PST 22.1 ± 15.7 , $P = 0.001$), Calgary Depression Rating Scale for Schizophrenia (baseline 4.2 ± 4.1 , post-PST 0.7 ± 1.0 , $P = 0.001$), Schedule for Assessing the Three Components of Insight (baseline 11.1 ± 3.4 , post-PST 16.2 ± 1.1 , $P < 0.0001$), and Quality of Life Scale for Patients with Schizophrenia (baseline 53.5 ± 20.0 , post-PST 79.6 ± 20.8 , $P < 0.0001$) changed significantly, whereas the change in mean score for the Suicide Probability Scale (baseline 75.1 ± 11.7 , post-PST 71.3 ± 8.0 , $P = 0.06$) did not reach statistical significance.

Conclusion: This study demonstrated the effects of PST on the symptoms and functioning of patients with schizophrenia. It can be concluded that using PST for the treatment of schizophrenia, as an adjuvant to pharmacotherapy, could produce significant positive results.

Key Words: Schizophrenia, psychosocial skills training, symptomatology, insight, quality of life, suicide

INTRODUCTION

Schizophrenia is a developmental disorder of the brain, which is characterized by positive, negative, cognitive, and affective symptoms. Schizophrenia generally has a life-long course with detrimental effects on quality of life and functioning.

Although its pharmacological treatment is fundamentally important, when it is not adequately supported with community-based psychological treatment programs its success tends to be limited. The most appropriate approach to the treatment of schizophrenia is the integration of pharmacological treatment with various specific psychological and community-based interventions (Marder et al., 1996; Schooler, 2006). In the treatment of schizophrenia, the addition of psychosocial skills

training (PST) to pharmacotherapy helps patients cope with the disorder, prevents exacerbation of symptoms and remission, and improves social functioning, insight, treatment compliance, and quality of life (Lieberman et al., 1986; Herz et al., 2000; Roder et al., 2002). It has been shown that the implementation of psychosocial treatment for first-episode patients results in a decrease in symptoms, improves patient adjustment to illness, and improves quality of life, while having a minimal effect on reducing relapse (Penn et al., 2005).

Various studies have shown that PST in combination with cognitive and behavioral treatment methods contributes considerably to the rehabilitation of schizophrenia patients (Heinssen et al., 2000; Granholm et al., 2005). Xiang and colleagues conducted a study (2006)

Received: 19.02.2007 – Accepted: 27.07.2007

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with 96 schizophrenia patients that received routine psychiatric outpatient care. In addition, 50% of the patients also received PST and the other 50% received supportive counseling, each for the duration of 6 months. Both groups were assessed with the Positive and Negative Syndrome Scale (PANSS) and Social Disability Screening Schedule (SDSS) before and after treatment, and the number of relapses and re-hospitalizations were recorded. It was shown that the PST group improved significantly more in terms of psychiatric symptoms and social functioning. It was shown that the rate of relapse and re-hospitalization was lower in the PST group, although the difference between the 2 groups was not statistically significant.

PST, which is frequently used in the rehabilitation of schizophrenia (Lieberman et al. 1993), was adapted into Turkish and administered to a group of patients (Yıldız et al., 2004). Yıldız and colleagues observed a decrease in clinical symptoms, and an increase in quality of life and social functioning. In another study by Yıldız and colleagues (2002) it was reported that there was a significant reduction in the Brief Psychiatric Rating Scale (BPRS) score, from 42 to 37.1 after 8 months of PST. In a study by Üçok and colleagues (2002), PST was given weekly (for 1 year) as an adjuvant to pharmacotherapy to 10 schizophrenia patients that were receiving routine psychiatric outpatient care. They used BPRS and the Quality of Life Scale for Patients with Schizophrenia (QLS) to evaluate the pre- and post-treatment clinical results. All 10 patients had significant increases on QLS inter-personal relationships, psychological findings, and personal activities sub-scale scores, as well as an increase in total QLS score, whereas there were no differences in the occupational role sub-scale score or BPRS score.

PST decreases symptom severity in schizophrenia patients and reduces the rate of comorbidity, such as substance use (Mueser and Bond, 2000). In follow-up studies conducted with schizophrenia patients, pharmacological treatment was compared to pharmacological treatment + PST, in terms of psychotic symptom exacerbation, and it was reported that psychotic symptom exacerbation rates were lower in the pharmacological treatment + PST arms (Hogarty et al., 1986; Hogarty et al., 1991). Other findings support the notion that PST results in a decrease in the negative symptoms of schizophrenia (Dobson et al., 1995).

Suicidal behavior is a frequently encountered phenomenon in schizophrenia (Heila et al., 1997; Heila et al., 1999). Henrikson and colleagues (1993) reported a

suicide attempt rate of 25% in schizophrenia. Lability and the unexpected emergence of a depressive mood are important indicators of suicide in patients with schizophrenia (Nordentoft et al., 2002).

The hypothesis of the present study was as follows: PST added to pharmacotherapy will result in clinical improvement, increase insight, improve quality of life, and reduce the probability of suicide in patients with schizophrenia. The aim of this study was to analyze the effect of PST on symptoms, insight, quality of life, and suicide probability in schizophrenia patients.

METHODS

Study Sample

The study was conducted with the cooperation of the Celal Bayar University Department of Psychiatry and the Manisa Living with Schizophrenia Association. The study sample consisted of 22 patients diagnosed with schizophrenia (according to DSM-IV criteria) that were followed-up at Celal Bayar University, Department of Psychiatry, Psychosis Outpatient Clinic. Two of the patients were receiving classical + atypical antipsychotics (clozapine 400 mg/day + zuclopenthixol [depot injection] every 15 days and risperidone 2 mg/day + flupenthixol 3 mg/day), one patient was receiving a classical antipsychotic (thioridazine 25 mg/day), and all the other patients were using atypical antipsychotics (generally at low doses). The drugs and the doses did not change during the course of PST. The PST groups consisted of 19 patients (86%) in total and each group was conducted for approximately 6 months (between October and March) during 3 consecutive years. The first group began with 8 patients and 1 female patient dropped out without providing a reason. The second group also began with 8 patients and they all completed the group training. The third group started with 6 patients and 2 female patients dropped out without providing reasons.

Inclusion criteria for the study were as follows:

- aged between 18 and 60 years;
- at least a primary school education;
- completed acute treatment and currently receiving maintenance drug treatment;
- consent of the patient and the patient's family to participate.

Exclusion criteria were current exacerbation of psy-

Table I. Sociodemographic characteristics of the patients (n = 19).

Gender	n	%
Male	12	63.1
Female	7	36.9
Marital Status		
Never married	14	73.7
Married	4	21.1
Divorced	1	5.2
Level of Education		
Primary-Secondary School	7	36.9
High School	9	47.3
University	3	15.8
Employment		
Never/Not employed	9	47.3
Temporarily employed	4	21.1
Employed	6	31.6

chotic symptoms, mental retardation, and an alcohol/substance abuse disorder.

Study Tools

PST for schizophrenia was prepared based on the cognitive and behavioral treatment techniques in the literature (Yıldız et al., 2004) with the aim of improving the psychology and social skills of the patients. The program was based on some of the modules of the Social Skills Training (Social and Independent Living Skills, Medication Management, Symptom Management, Recreation for Leisure Modules) Program created by Liberman and colleagues (1993) as used at UCLA. This training program aims to improve the coping skills of patients, improve their social functionality, and to ensure they have a more independent life style. It was administered, in the context of group therapy, to schizophrenia patients that were receiving routine outpatient care.

The skills domains of PST were as follows: communication skills, problem solving skills, understanding psychosis and schizophrenia, learning about antipsychotic drug treatment, learning about drug side effects, learning to cope with intractable symptoms, recognizing and monitoring the warning signs, abstaining from alcohol and other substances, minimizing the search for a cure, coping with stress, increasing self-confidence, time management of daily activities, developing friendships, and leisure activities.

The skills were acquired step by step, in small increments. The following active teaching methods were used: determining the purpose, briefing, setting an example, attitude rehearsals, role playing, supporting the desired

response, corrective feedback, attitude shaping, using appropriate social enhancers, generalization of education through exercises and homework, and family briefing.

The patients were evaluated pre- and post-training with the 6 following scales.

1. Scale for the Assessment of Positive Symptoms (SAPS): SAPS is an interviewer-rated scale developed by Andreasen (1990) for evaluating the level, distribution, and severity of positive symptoms in schizophrenia. Because the cut-off score has not been calculated by the validity and reliability study of the Turkish version (Erkoç et al., 1991a), it is used only for comparative studies. The scale consists of 4 sub-scales and 34 items; each item has 6 possible responses. 2.

3. Scale for the Assessment of Negative Symptoms (SANS): SANS is an interviewer-rated scale developed by Andreasen (1990) for evaluating the level, distribution, and severity of the negative symptoms of schizophrenia. Because the cut-off score has not been calculated by the validity and reliability study of the Turkish version (Erkoç et al. 1991b), it is used only for comparative studies. The scale consists of 5 sub-scales and 25 items; each item has 6 possible responses.

4. Calgary Depression Rating Scale for Schizophrenia (CDSS): CDSS is an interviewer-rated scale developed by Addington and colleagues (1992) for evaluating depression, and changes in the level and severity of depressive symptoms in patients with schizophrenia. It consists of 9 items answered on 4-point Likert-type scale. In the validity and reliability study of the Turkish version the cut-off score was reported to be 11/12 (Aydemir et al., 2000).

5. Schedule for Assessing the Three Components of Insight (SAI): David (1990) reported that insight was not an all-or-nothing phenomenon and developed this scale to quantitatively evaluate insight based on 3 components: therapy compliance, awareness of illness, and correct identification of psychotic symptoms. It is a semi-structured, clinician-rated scale that consists of 8 questions. The highest total score for the first 7 questions is 14. The eighth question (in cases of when people do not believe you, how do you feel?) is a hypothetical question and it is up to the discretion of interviewer to ask the question or not. With the addition of the last question, the highest total score is 18. Higher scores indicate higher levels of insight. The reliability and validity study of the Turkish version was conducted by Aslan and colleagues (2001).

Table II. Pre- and post-PST scale scores.

	Pre-PST	Post-PST	Z	P
Scale for the Assessment of Positive Symptoms (SAPS)	8.5 ± 9.9	3.4 ± 6.0	-2.863	0.004
Scale for the Assessment of Negative Symptoms (SANS)	33.7 ± 19.3	22.1 ± 15.7	-3.343	0.001
Calgary Depression Rating Scale for Schizophrenia (CDSS)	4.2 ± 4.1	0.7 ± 1.0	-3.419	0.001
Schedule for Assessing the Three Components of Insight (SAI)	11.1 ± 3.4	16.2 ± 1.1	-3.734	< 0.0001
Quality of Life Scale for Patients with Schizophrenia (QLS)	53.5 ± 20.0	79.6 ± 20.8	-3.823	< 0.0001
Quality of Life Scale for Patients with Schizophrenia (QLS) Interpersonal relations sub-scale	21.4 ± 7.2	31.1 ± 7.3	-3.786	< 0.0001
Quality of Life Scale for Patients with Schizophrenia (QLS) Occupational role sub-scale	9.8 ± 4.3	14.6 ± 4.2	-3.850	< 0.0001
Quality of Life Scale for Patients with Schizophrenia (QLS) Psychological symptoms sub-scale	17.2 ± 7.4	26.2 ± 7.5	-3.828	< 0.0001
Quality of Life Scale for Patients with Schizophrenia (QLS) Personal object/activity sub-scale	4.9 ± 2.0	7.5 ± 2.1	-3.785	< 0.0001
Suicide Probability Scale (SPS)	75.1 ± 11.7	71.3 ± 8.0	-1.877	0.06

6. Quality of Life Scale for Patients with Schizophrenia (QLS): QLS is a scale developed by Heinrichs and colleagues (1984) for evaluating quality of life of patients with schizophrenia. The validity and reliability study of the Turkish version was conducted by Soygar and colleagues (2000). QLS is administered during a face-to-face interview and each of the 21 items is scored on a 7-point Likert-type scale. Apart from the total score of the scale, interpersonal relationships, occupational role, psychological findings, and personal object/activity constitute the sub-scale domains, which can also be scored.

7. Suicide Probability Scale (SPS): SPS is a 36-item self-assessment scale that was developed by Cull and Gill (1988). It is scored on a 4-point Likert-type scale. The scale evaluates the probability of suicide in adolescents and adults. Higher scores indicate higher probability for suicide. A study of the scale in Turkey suggests it is valid and reliable for use in the Turkish population (Batıgün and Şahin, 2003).

PROCEDURE

PST sessions were conducted at the Manisa Living with Schizophrenia Association. PST groups were facilitated by a psychiatrist who served as permanent group leader (AD) and 3 additional psychiatry residents (FY, FD, EGY). The group leader was trained by M. Yıldız. The groups were conducted at separate times and each

group lasted for 6 months. The groups were conducted on the same day and at the same time every 2 weeks, as two 45-minute sessions. At least 1 session was reserved to address each sub-title of PST. Furthermore, group members were given homework between the sessions that dealt with the skill domains that they had worked on during role-playing. Homework was discussed during the first session of the following week and comments and feedback were received. During PST, families were briefed once a month for 1 hour about the content of the training and the homework, to ensure the family's contribution, collaboration, and control. The patients were monitored regularly during PST by the physicians in charge of their treatment. All of the patients attended PST regularly and there was no exacerbation of symptoms or hospitalization during the course of the therapy. The patients were evaluated using SAPS, SANS, CDSS, SAI, QLS, and SPS. Pre- and post-PST evaluations of the patients based on the 6 scales were conducted by a psychiatrist (AED) who served as a member of the research team and monitored the patients at the psychiatric outpatient clinic.

Statistical Analysis

Study data were analyzed with SPSS v.11.0. Relationships between age, years of education, duration of illness, number of hospitalizations, and scale scores were evalu-

ated with Pearson's correlation analysis. Comparison of the scale scores according to gender, schizophrenia subtype, and resistance to pharmacotherapy were carried out with the Mann-Whitney U test. Finally, the significance of the differences between pre- and post-PST scale scores was assessed with the Wilcoxon paired sample test.

FINDINGS

The study was completed with 19 patients (86%) that were placed in 3 different groups conducted at 3 different times. Three patients dropped out (14%). All 3 of the dropouts were female and did not provide any information about their reasons for dropping out. Mean age of the patients was 29.7 ± 10.5 years. All of the patients were living with their families. The sociodemographic characteristics of the patients are shown in Table I.

When the patients were grouped according to subtypes, it was observed that 9 were of the paranoid type (47.4%) and 10 were of the residual type (52.6%). In all, 68.4% of the patients ($n = 13$) were not resistant to pharmacotherapy, whereas 31.6% were resistant to pharmacotherapy. Mean duration of illness was 6.9 ± 5.9 years and the mean number of hospitalizations was 1.2 ± 0.9 . The patients were evaluated before and after PST with the following scales: SAPS, SANS, CDSS, SAI, QLS (QLS interpersonal relations sub-scale, QLS occupational role sub-scale, QLS psychological findings sub-scale, and QLS personal activities sub-scale), and SPS. Comparison of the scale scores are shown in Table II.

The difference between pre- and post-PST SAI scores was calculated and the relationship between the change in scores and age was investigated. There was a statistically significant negative relationship observed between age and insight ($r = -0.540$, $P = 0.017$). The difference between pre- and post-PST SPS total scores was calculated and the relationship between the number of hospitalizations and the change in scores was investigated. It was observed that there was a statistically significant positive relationship between the number of hospitalizations and suicide probability ($r = 0.518$, $P = 0.023$).

The difference between pre- and post-PST QLS interpersonal relations sub-scale scores was calculated. The relationship between gender and the change in the scale scores was investigated. It was observed that the increase in the total score of the sub-scale was greater in females than in males (12.5 ± 4.6 and 8.0 ± 4.3 , respectively; $Z = 1.994$, $P = 0.046$). The difference between pre- and post-PST SAI total scores was calculated and the relationship between the difference in scores and resistance

to pharmacotherapy was investigated. It was noted that the increase in insight scores of the resistant patients was greater than that of the non-resistant patients (7.6 ± 3.0 and 3.8 ± 3.2 , respectively; $Z = 2.215$, $P = 0.027$).

The difference between pre- and post-PST SPS total scores was calculated and the relationship between the difference in scores and resistance status was investigated. It was observed that suicide probability of the resistant patients was greater than that of the non-resistant patients (3.6 ± 4.9 and -7.2 ± 6.3 , respectively; $Z = 2.911$, $P = 0.004$).

DISCUSSION

There was a significant reduction in the positive, negative, and concomitant depressive symptoms among the patients that received PST + pharmacotherapy. The results of our study suggest that the increase in the patients' abilities and knowledge at the end of PST, in the areas of problem solving, understanding psychosis and schizophrenia, learning about antipsychotic medications, and coping with stress, decreased the severity of their psychiatric symptoms. The fact that the patients were on maintenance therapy made it difficult to discern if the observed positive changes were due to PST or a consequence of drug treatment. It has been reported that PST improves social ability; however, it has also been reported that PST is inadequate for preventing psychopathology and symptom exacerbation (Bustillo et al., 2001). Nevertheless, according to the literature, a decrease in the frequency and severity of psychiatric symptoms, exacerbation of symptoms, and hospitalization follows the acquisition of skills (Dobson et al., 1995; Yıldız et al., 2002; Penn et al., 2005; Xiang et al., 2006). In a study by Moriana and colleagues (2006), a group of 32 patients that received 6 months of PST in addition to pharmacotherapy were compared with a group of patients that received only pharmacotherapy. They reported a significantly greater decrease in PANSS scores in the PST + pharmacotherapy group. Our study is significant because it demonstrated the importance of PST as a treatment modality for decreasing positive and negative symptoms. We observed the validity of the a priori hypothesis of the study. The application of some of the PST modules, such as understanding psychosis and schizophrenia, learning about antipsychotic medication, learning about drug side effects, evaluation of treatment, and coping with the obstinate symptoms, contributed to the end result.

In a multi-center study by Yıldız and colleagues

(2002), the effect of social skills training was investigated. The study included 3 centers, 38 patients, and 8 groups. In all, 84% of the patients were male and mean age was 32 ± 7 years. BPRS, QLS, and the Drug Compliance Scale (DCS) were administered before and after the group therapy. A significant decrease in mean BPRS score (baseline 42.0, post-treatment 37.1, $P < 0.02$) and a significant increase in mean QLS score (baseline 67.5, post-treatment 75.3, $P < 0.01$) were reported. There was a 20.6% increase in the patients' knowledge about the treatment and symptoms of the disease, and an increase in the patients' treatment compliance was observed at the end of the group training. The results of the study suggest that social skills training increases compliance, treatment efficacy, and quality of life. In another study, 15 patients received PST in addition to pharmacotherapy and 15 patients continued with standard drug therapy. The following scales were administered before and after the intervention: PANSS, QLS, Social Functioning Scale, and Global Assessment of Functioning Scale. A decrease in PANSS scores and significant increases in QLS and Social Functioning Scale scores were reported. It was suggested that PST's contribution to the patients' functionality might have been substantial (Yıldız et al., 2004). In another study, Yıldız and colleagues (2005) reported an increase in patient knowledge about disease and treatment in their own group applications. Based on the feedback they received from the patients' families, they also reported that the patients were more skilled in the areas of communication, socialization, drug therapy, and disease symptoms. All of the patients were positively rated by their families in the areas of communication, socialization, drug therapy, and coping with disease symptoms. The results of these 3 studies support the results of the present study.

The significant increases in QLS total score and QLS sub-scale scores (interpersonal relationships, occupational role, psychological findings, and personal object/activity) in our post-PST measurements suggest that the patients' quality of life increased in most areas.

A 2-year follow-up of a group of schizophrenia patients that received skills training has shown that new skills were incorporated into the social functionality of the patients (Lieberman et al., 1998). Our quality of life findings agree with the results of a study by Üçok and colleagues (2002), except for the QLS occupational role sub-scale results, for which the change was insignificant. Improvement of social relationships, acquisition of new skills and hobbies, and an appropriate profession are among the findings pointing to an increase in patient

quality of life. In the present study QLS interpersonal sub-scale total score was higher in females than in males at post-PST. This finding could have been caused by the sociocultural characteristics of Turkish society.

It is generally acknowledged that disease insight is a multidimensional concept that includes awareness of the disease, the disease's effect on social relationships, the consequences of drug treatment, and symptoms. In most schizophrenia patients there is an impairment of insight at some point during the course of the disease (Mintz et al., 2003). PST programs increase schizophrenia patients' disease insight, improve quality of life, and enhance social integration (Roder et al., 2002). A low level of insight in schizophrenia is associated with difficulties with treatment compliance and an increase in psychopathology (Lysaker et al., 1994). In the present study the high insight scores were related to the fact that the patients had completed acute treatment and were on maintenance therapy. Mean insight score increased significantly following the PST program. Although the PST program raised insight scores, there was a negative relationship between age and insight acquisition. In a study by Rossell and colleagues (2003), it was shown that the lack of insight in schizophrenia is associated with positive symptoms and that there is a positive relationship between insight and executive functions. It is also known that aging facilitates deterioration of executive functions (Fucetola et al., 2000). In the present study we also observed a negative relationship between age and the level of insight. Patients in the present study that were resistant to drug therapy had a greater increase in insight score than the patients that were not resistant to drug therapy, which could be explained by PST. It has been shown that the processing of disease-related information during this training program was more effective in patients suffering from positive symptoms, despite drug therapy, and that increases in patient insight about disease symptoms were much greater.

Suicidal behavior is common in schizophrenia. According to Mortensen (1995), the 1-year suicide rate among first episode schizophrenia patients receiving routine psychiatric outpatient care is 1%-2%. In a 1-year follow-up study conducted with first-episode schizophrenia patients, it was shown that hallucinations and a history of suicide attempts were the strongest determining factors for suicidal behavior (Nordentoft et al., 2002). Patient perception of disease severity, long and frequent hospitalization, deterioration after a short period of time following hospital discharge, concomitant depression, and previous suicide attempts are the factors associated with

increased risk of suicide (Heila et al., 1999; Tandon and Jibson, 2003). Although positive symptoms are considered an important risk factor by some researchers, others have reported contradictory findings. These researchers have reported that delusions and hallucinations were not related to suicide; whereas they demonstrated a relationship between depression and suicide (Grunebaum et al., 2001; Messias et al., 2001; Schwartz and Cohen, 2001). Premorbid intelligence (Siris, 2001), substance abuse (Kamali et al., 2000), increased insight (Schwartz, 2001), and drug-induced akathisia (Atbaşoğlu et al., 2001) were reported to be associated with suicide. Treatment of the positive symptoms and depression, decreasing substance abuse, avoiding akathisia, and maintaining a positive outlook are important interventions for the prevention of suicide. New generation antipsychotics and psychological approaches, especially cognitive behavioral therapies, are useful in reducing the incidence of suicide in schizophrenia (Tandon and Jibson, 2003). One study reported improvement in insight as a result of a brief educational intervention, although, there was an increase in suicidal ideation (Cunningham and Owens, 2001). In the present study, although there wasn't a significant decrease in suicidal ideation, the observed decreases in mean scores could have been associated with the decreases in positive, negative, and depressive symptoms, and the increase in the quality of life. The finding of a positive relationship between the number of hospitalizations and suicide probability, despite PST, was in line with the literature. Furthermore, the increased sui-

cide probability observed among the patients resistant to drug therapy, in comparison to the patients that weren't, was also in line with the literature (Heila et al., 1999; Tandon and Jibson, 2003).

There are certain limitations to the present study. The lack of a comparative control group is regarded as an important limitation. Additional studies should be conducted to address this limitation. Although we attempted to increase the number of patients within each study group, we could have used more groups to overcome the limitation caused by a small sample size. It was also thought that the small sample size was associated with a standardization problem. Patient evaluations were carried out 1 month after PST, which is considered a strong point of the study; however, evaluations after a longer period of follow-up are also necessary. Despite the fact we ensured that the scales were administered by someone other than a therapist involved in the PST, the fact that the post-group evaluations were not carried out by researcher other than ourselves is another limitation of the study.

In conclusion, this study demonstrated that PST made important contributions to the improvement in the schizophrenia patients' symptoms and functionality. It is expected that the addition of this educational program into the routine treatment of schizophrenia would provide significant positive outcomes. PST should be regarded as a treatment option in schizophrenia due to its efficacy and its use should be generalized in Turkey.

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