

Current Clinical Variables in Schizophrenia Cases with Suicide Attempt History



Demet SAĞLAM AYKUT¹, Filiz CİVİL ARSLAN², Evrim ÖZKORUMAK KARAGÜZEL³,
Serdar KARAKULLUKÇU⁴, Ahmet TİRYAKİ⁵

SUMMARY

Objective: High suicide risk was shown to be related with depression and low quality of life in studies investigating clinical variables related to suicidal behavior. The aim of this study was to investigate the effects of a suicide attempt on clinical presentation by comparing sociodemographic variables, clinical signs, symptoms of depression, quality of life, social functionality, and reported adverse drug reactions in schizophrenic patients with and without suicide.

Method: Positive and Negative Syndrome Scale (PANSS), Calgary Depression Scale (CDS), Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q), Social Functioning Scale (SFS), and Udvalg for Kliniske Undersøgelser Side Effect Rating Scale (UKU) were administered to 115 patients with schizophrenia.

Results: 44.3% of patients had at least one suicide attempt. Among sociodemographic variables, a family history of suicide, smoking, and total duration of disease were significantly higher in patients with suicide history than without. Scores of CDS and UKU subscores were significantly higher, and quality of life and social occupation in social functionality were significantly lower in patients with a history of suicide. In correlation analysis, CSD was negatively correlated with Q-LES-Q and independency/performance subscore of SFI, and positively correlated with UKU-Neurological subscore.

Discussion: In line with this data, suicidal behavior may be suggested to affect clinical presentation and course characteristic of schizophrenic patients. Additional treatments towards factors that may impact on the clinical course and social support programs might be suggested for these patients.

Keywords: Schizophrenia, suicide, depression, quality of life

INTRODUCTION

Attempted suicide in patients with schizophrenia is a severe complication of this disease, and suicide is one of the causes of death of schizophrenia patients in the early period (Mauri et al. 2013). Suicidal behavior in schizophrenia patients is estimated to be 10% higher than in patients with mood disorder and 20% higher than in the general population (Altamura et al. 2003). Forty percent of schizophrenia patients are reported

to attempt suicide at least once in their lives (Meltzer et al. 2000). In addition, suicide attempts in schizophrenia patients are made with no previous trigger or verbal expression of intent, making it difficult to determine the predictive agents of attempted suicide in these patients (Togay et al. 2015).

There has been increasing interest in understanding the factors predisposing to suicide in recent years (Pompili et al. 2007). In research studies investigating the clinical importance of

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^{1,2}Assist. Prof., ^{3,5}Assoc. Prof., Karadeniz Technical University, School of Medicine, Department of Psychiatry, Trabzon, ⁴Research Assist., Karadeniz Technical University, School of Medicine, Department of Public Health, Trabzon, Turkey.

e-mail: demetsaglam@hotmail.com

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suicidal behavior seen in schizophrenia patients, an increased risk of attempted suicide has been associated with white race, male gender, young age, unemployment, living conditions, a positive family history in terms of suicidal behavior and psychiatric diseases, concurrent substance abuse, and the lack of a supportive environment (Mauri et al. 2013).

Some studies have focused on the role of clinical symptoms in schizophrenia on attempted suicide. One review by Hawton and Heeringer (2009) determined that deaths from suicide were correlated with a history of depression, a history of akathisia or agitation, a sense of worthlessness or low self-esteem, a history of depression in the family, and a recent history of loss. In addition, the presence of a feeling of anxiety or despair reported at high levels in self-reports has also been shown to be associated with suicide attempts seen in schizophrenia patients (Altamura et al. 2003). The presence of findings of paranoia in schizophrenia patients has been evaluated as a risk factor for the development of depression (Messias et al. 2001). In addition, the presence of delusions in these patients has been considered as a risk factor for attempted suicide seen in schizophrenia and schizophrenia spectrum disorders (Altamura et al. 2003).

Symptoms of depression are one important risk factor for suicide in patients with schizophrenia (Yan et al. 2013, Kao et al. 2011). Kao et al. (2011) showed that the risk of suicide in schizophrenia is associated with depression and a poor quality of life.

Long-term treatment with antipsychotic drugs is associated with lower mortality than in subjects not receiving these drugs (Tiihonen et al. 2009), while there is little general evidence of the preventive effect of antipsychotic therapy (Pompili et al. 2007). Additionally, a few reports have noted an association between extrapyramidal side effects such as akathisia, typically triggered with antipsychotic drugs, and suicidal behavior (Altamura et al. 2003).

The purpose of this study was to investigate how suicidal behavior as a characteristic of schizophrenia patients affects patients' existing clinical characteristics by comparing the sociodemographic data, disease symptoms, depressive symptoms, quality of life, social functioning, and reported drug side-effects in schizophrenia patients with and without a history of attempted suicide.

MATERIALS and METHODS

Sampling

198 patients with schizophrenia who presented to Ataköy Mental Health and Neurological Diseases Hospital, Turkey, psychiatric clinics between January and August, 2014 who had been receiving the same medication for the previous 3

months and were under monitoring in the remission period with a diagnosis of schizophrenia were evaluated cross-sectionally by the physician conducting the study with information from the psychiatrists treating the patients and medical file scans. Eighty-three patients were excluded from the study due to identification of additional psychiatric or physical diseases or due to inability to complete the scales. The remaining 115 patients were enrolled in the study.

Method

115 patients diagnosed with schizophrenia on the basis of DSM-IV by the application of Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) receiving the same medication for the previous 3 months and being monitored in the remission period were enrolled. The patients enrolled were informed about the research and provided written informed consent, after which their sociodemographic characteristics were recorded. All patients were administered the Positive and Negative Symptoms Scale (PANSS) to assess severity of symptoms, the Calgary Depression Scale for Schizophrenia (CDSS) to assess depressive symptoms, the Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q) short form to assess quality of life, the Social Functioning Scale (SFS) to evaluate social, and the Udvalg for Kliniske Undersøgelser (UKU) Side Effect Rating Scale to assess drug side-effects. The physician conducting the research performed clinical interviews and SCID-I, PANSS, CDSS, Q-LES-Q, SFS and UKU applications.

The study commenced with Province of Trabzon Public Hospitals Union General Secretariat Kanuni Training and Research Hospital ethical committee approval and official written permission from the hospital administration.

Patients with psychiatric diagnoses other than schizophrenia based on DSM-IV with the application of SCID-I with previous diagnosis of dementia, with a history of physical disease affecting the central nervous system, with a history of head trauma sufficient to cause lack of consciousness, with mental retardation, or from whom informed consent could not be obtained were excluded from the study.

Evaluation Tools

Sociodemographic Data Form: This was designed by the authors in order to assess the sociodemographic data (age, sex, marital status, employment status, etc.) and clinical features (suicidal behavior and related characteristics, age at onset of disease, total duration of disease, total number of hospitalizations, etc.) of the participants.

Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I): SCID-I was developed in 1987 for the purpose of diagnosing DSM-III-R Axis I disorders using a clinical

structured clinical assessment tool (Spitzer et al. 1987). It was subsequently brought up to date for DSM-IV (First et al. 1997).

Positive and Negative Syndrome Scale (PANSS): This is a semi-structured interview scale consisting of 30 items and a 7-point severity evaluation developed by Kay et al. (1987). Seven of the 30 psychiatric factors comprise the positive symptoms subscale, another seven the negative subscale, and the remaining 16 the general psychopathology subscale. Reliability and validity study of the Turkish-language version was performed by Kostakoğlu et al. (1999).

Calgary Depression in Schizophrenia Scale (CDSS): This scale was developed by Addington et al. (1992). The reliability and validity of the Turkish-language version was studied by Aydemir et al. (2000). The scale is evaluated by the interviewer and consists of nine 4-point Likert-type items. These include (1) depression, (2) hopelessness, (3) self-depreciation, (4) guilty ideas of reference, (5) pathological guilt, (6) morning depression, (7) early waking, (8) suicide, and (9) observed depression. During the development of the CDSS, the objective was to avoid being affected by the positive and negative symptoms of schizophrenia or extrapyramidal side effects; there are studies showing that this was achieved. A cut-off point of 11/12 for schizophrenia accompanied by depressive disorder has been determined for the Turkish version of the CDSS. A cut-off point of 11 was applied in this study.

Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q): This self-report questionnaire was developed by Endicott et al. (1993) to measure quality of life. High scores indicate high levels of contentment and satisfaction. The reliability and validity of the Turkish-language version of the questionnaire were reported to have been studied by Özer et al. (2001), but no psychometric data were stated. The general evaluation section of the scale has been used in some studies in Turkey. That section was also used in this study.

Social Functioning Scale (SFS): Developed by Birchwood et al. (1990), the reliability and validity of the SFS in Turkey was studied by Erakay (2001). The scale is completed by a family member living with the patient. It consists of six subscales, social engagement/withdrawal, interpersonal behavior, primary social activities, free time activities, independence, and work/employment. High scores from the six subscales show a positive tendency in functioning. Standards have been calculated and are used in comparative studies. Only the form completed by the patient was included in the calculation in this study, since not all patients' relatives could be contacted.

Udvalg for Kliniske Undersøgelser (UKU) Side Effect Rating Scale: This consists of three sections containing 48 items assessing psychological, neurological, autonomous system, and general side effects. Each item is scores from 0 – no side effect – to 3 – severe (Lingjaerde et al. 1987).

Statistical Analysis

Variables' compatibility with normal distribution was assessed using the Kolmogorov-Smirnov test. Descriptive analyses were expressed as mean and standard deviation for normally distributed data or as median and maximum/minimum for non-normally distributed variables. The chi-square test was used to compare qualitative data, Student's t-test to analyze normally distributed parameters, and the Mann-Whitney U test for non-normally distributed parameters. P values lower than 0.05 were regarded as statistically significant. The significance level in comparisons involving scale subdimensions was set at $0.05/6=0.008$ following Bonferroni correction. Spearman correlation analysis was used since normal distribution conditions were not established at comparison of correlation between two measurement data.

RESULTS

Attempted suicide was identified in the histories of 44.3% ($n= 51$) of the 115 patients in the study. One attempt was determined in 70.6% ($n= 36$) of all patients with a history of attempted suicide, two in 11.8% ($n= 6$), three in 11.8% ($n= 6$), four in 3.9% ($n= 2$), and six in 2.0% ($n= 1$). Twenty-five (52.1%) of the patients who had attempted suicide did so by taking drugs, one (2.1%) by taking rat poison, six (12.5%) by means of self-harm (cutting the wrists, stabbing themselves, attempting to cut their own throats), twelve (25.0%) by jumping from heights (from a tall building, into the sea, from a moving vehicle), two (4.2%) with guns, and two (4.2%) by hanging. Demographic and clinical characteristics depending on whether or not participants had attempted suicide are summarized in Table 1.

The patients enrolled in the study were treated with single or dual depot and oral second generation antipsychotic therapies. According to their own accounts and information from families, these patients were being monitored with manifestations of remission with the same treatment for the previous three months and regularly taking their medications.

No statistically significant differences were observed in PANSS P, PANSS N, and PANSS G scores between patients with or without histories of attempted suicide ($p>0.05$). CDSS scores of subjects with histories of attempted suicide were significantly higher than those of patients with no history of attempted suicide ($p<0.001$). In addition, the mean Q-LES-Q score of subjects with histories of attempted suicide was 52.3 ± 8.1 , compared to 58.0 ± 7.8 among those with no such history. Q-LES-Q scores of subjects with histories of suicide were statistically significantly lower than those of subjects with no history of attempted suicide ($p<0.001$). Comparison of SFS subscale scores between the two groups revealed significantly lower "Social withdrawal" subscale scores in patients

Table 1. Sociodemographic Data and Clinical Characteristics of the Patient Groups

	Patients with history of attempted suicide (n=51)	Patients without history of attempted suicide (n=64)	p-value
Age (years) [Mean±SD]	40.3±9.7	37.4±9.4	0.112*
Gender [n (%)]			0.502**
Men	27 (52.9%)	39 (60.9%)	
Women	24 (47.1%)	25 (39.1%)	
Marital status [n (%)]			0.108**
Single	21 (41.2%)	39 (60.9%)	
Married	23 (45.1%)	19 (29.7%)	
Widow	7(13.7%)	6 (9.4%)	
Duration of education (years) [Mean±SD]	9.5±4.0	9.7±3.7	0.802*
Employment status [n (%)]			1.000**
Positive	22 (43.1%)	28 (43.7%)	
Negative	29 (56.9%)	36 (56.3%)	
Person whom live with [n (%)]			0.684**
Parents, partner	46 (90.2%)	55 (85.9%)	
Alone	5 (9.8%)	9 (14.1%)	
History of psychiatric disease in the family [n (%)]			0.002**
Positive	31 (60.8%)	19 (29.7%)	
Negative	20 (39.2%)	45 (70.3%)	
Smoking [n (%)]			0.007**
Positive	26 (51.0%)	16 (25.0%)	
Negative	25 (49.0%)	48 (75.0%)	
Alcohol and substance use [n (%)]			1.000**
Positive	0 (0.0%)	1 (1.6%)	
Negative	51 (100.0%)	16 (98.4%)	
Comorbid psychiatric disease [n (%)]			0.086**
Positive	5 (9.8%)	1 (1.6%)	
Negative	51 (90.2%)	53 (98.4%)	
Comorbid medical disease [n (%)]			0.008**
Positive	19 (37.3%)	9 (14.1%)	
Negative	32 (62.7%)	55 (85.9%)	
Total usage time of the last treatment (months) [Median (min-max)]	12 (1 – 120)	12 (1- 120)	0.695#
Total duration of disease (years) [Mean±SD]	14.80±7.48	11.23±7.42	0.012*
The total number of hospitalizations [Median (min-max)]	3 (0 – 12)	2 (0 - 15)	0.099#

Mean±SD: Mean ± Standard Deviation, AP: Antipsychotic

* Student's t test, ** Chi-square test, # Mann-Whitney U Test

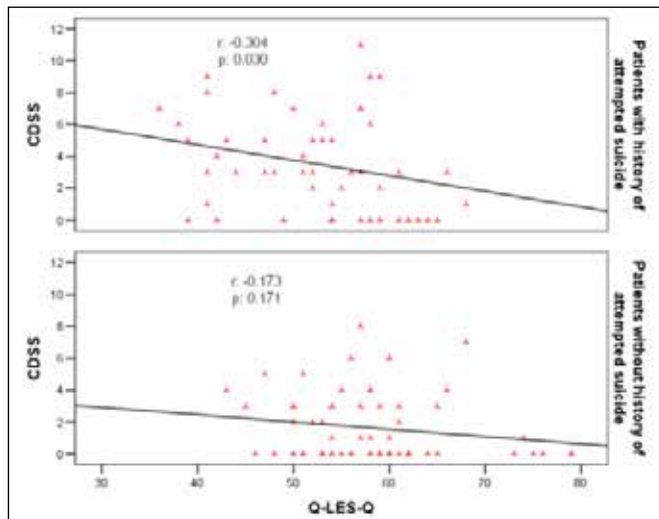
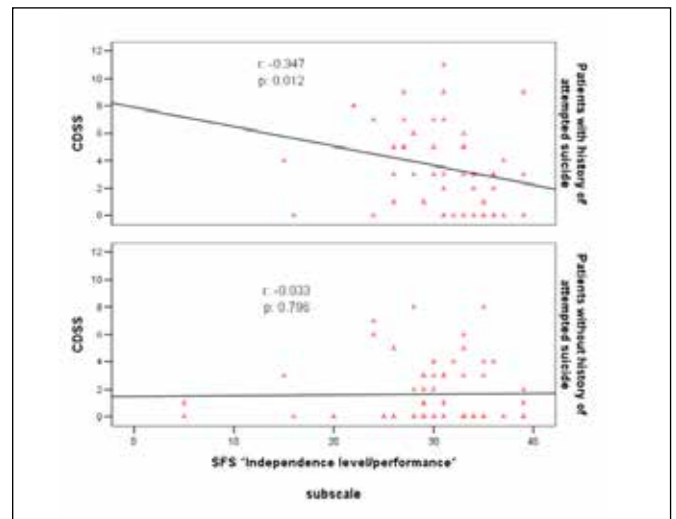
**Figure 1.** Correlation Analysis between CDSS and Q-LES-Q CDSS: Calgary Depression Scale for Schizophrenia, Q-LES-Q: Quality of Life Enjoyment and Satisfaction Questionnaire.**Figure 2.** Correlation Analysis between CDSS and SFS 'Independence level/performance' subscale CDSS: Calgary Depression Scale for Schizophrenia, SFS: Social Functioning Scale.

Table 2. PANSS, CDSS, Q-LES-Q, SFS and UKU Scores of Patient Groups

	Patients with history of attempted suicide (n=51)	Patients without history of attempted suicide (n=64)	p-value
PANSS P [Median (min-max)]	7 (7-20)	7 (7-20)	0.316#
PANSS N [Median (min-max)]	7 (7-23)	7.5 (7-27)	0.174#
PANSS G [Median (min-max)]	17 (16-38)	18 (16-32)	0.387#
CDSS [Median (min-max)]	3 (0-11)	0 (0-8)	<0.001#
Q-LES-Q [Mean±SD]	52.3±8.1	58.0±7.8	<0.001**
SFS [Median (min-max)]			
Social activity/social Withdrawal	11 (7-15)	13 (7-15)	<0.001#
Interpersonal behavior	8 (6-9)	7 (5-9)	0.375#
Common social activities	17 (3-34)	17.5 (6-27)	0.208#
Spare time activities	14 (10-23)	14 (9-23)	0.176#
Independence level/effectiveness	39 (13-39)	39 (13-39)	0.239#
Independence level/performance	31 (15-39)	30.5 (5-39)	0.380#
UKU [n (%)]			
Psychic	26 (51.0%)	36 (56.3%)	0.708*
Neurological	6 (11.8%)	8 (12.5%)	1.000*
Autonomic	12 (23.5%)	13 (20.3%)	0.851*
Other	18 (35.3%)	9 (14.1%)	0.014*
Side effect	24 (47.1%)	20 (31.3%)	0.124*
Intervention	12 (23.5%)	10 (15.6%)	0.405*

PANSS: Positive and Negative Syndrome Scale; CDSS: Calgary Depression Scale for Schizophrenia; Q-LES-Q: Quality of Life Enjoyment and Satisfaction Questionnaire; SFS: Social Functioning Scale; UKU: (Udvalg for Kliniske Undersøgelser) Side-Effect Rating Scale.

Mean±SD: Mean ± Standard Deviation, AP: Antipsychotic

Mann–Whitney U test, * Chi-square test, ** Student's t-test

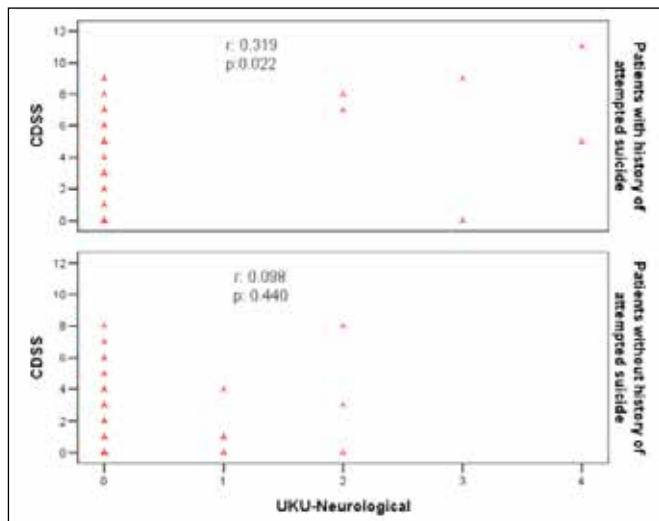


Figure 3. Correlation Analysis between CDSS and UKU 'Neurological' subscale CDSS: Calgary Depression Scale for Schizophrenia, UKU: (Udvalg for Kliniske Undersøgelser) Side-Effect Rating Scale.

with a history of attempted suicide compared to those with no such history ($p < 0.001$). No statistically significant difference was observed between the two groups in terms of other SFS subscale ($p > 0.05$). When UKU subscale scores (Psychic, Neurological, Autonomic, Other Side Effects and

Intervention) were compared, a statistically significant difference was determined in the "Other" subscale ($p = 0.019$). The UKU "Other" subscale includes skin eruptions, hypersensitivity reactions, weight changes, menstrual cycle changes, sexual function problems, headache, and addictions. There was no significant difference between the two groups in terms of the other UKU subscales ($p > 0.05$). In addition, the significance level in comparisons of scale subdimensions was taken as $0.05/6 = 0.008$. Under those circumstances, the significance in the UKU "Other" subscale between the two groups disappeared, while the significance in the SFS "Social withdrawal" subscale was preserved (Table 2).

In correlation analysis performed among the scales in both groups, a significant negative correlation was determined in the group with a history of attempted suicide compared to the no suicide history group between CDSS and the Q-LES-Q scale ($p = 0.030$, $r = -0.304$) (Figure 1) and the SFS "Free time activities" subscale ($p = 0.012$, $r = -0.347$) (Figure 2) and a significant positive correlation between CDSS and the UKU 'Neurological' subscale ($p = 0.022$, $r = 0.319$) (Figure 3). In the group with no history of attempted suicide, however, no statistically significant finding was observed in correlation analysis.

DISCUSSION

In this study, in order to identify the effect of a history of attempted suicide on clinical appearance in patients with schizophrenia, we planned to compare schizophrenia patients with or without a history of attempted suicide in terms of sociodemographic data, disease symptoms, depressive symptoms, quality of life, social functioning, and patient-reported drug side effects.

A history of at least one suicide attempt was determined in 44.3% of the schizophrenia patients constituting the study sample. In agreement with this finding, previous studies have reported that 40% of patients with schizophrenia attempt suicide at least once in their lives (Altamura et al. 2003), or that the level of attempted suicide in such patients ranges between 18% and 55% (Nordentoft et al. 2004).

In terms of sociodemographic data, no significant difference was observed between the groups with or without a history of attempted suicide in terms of sex, age, marital status, or employment status. In agreement with our study findings, studies in the literature have reported no significant difference between males and females in terms of attempted suicide in schizophrenia patients (Walsh et al. 2001). A study from Sweden showed that a history of attempted suicide, particularly in male schizophrenia patients, was a powerful risk factor for subsequent suicide attempts (Carlborg et al. 2009). Another study reported that suicide attempts were more common in females, particularly in first episode schizophrenia patients (Togay et al. 2015).

Previous studies have reported that a family history of psychiatric disease or suicide is strongly correlated with suicide attempts seen in patients with schizophrenia. It has been suggested that the presence of a parent with a history of psychiatric disease can lead to an increased risk of attempted suicide, either by means of a genetically transmitted predisposition associated with psychiatric disease or, for example, by an adverse effect on family life, such as a decrease in child care (Pawlak et al. 2013). In support of these findings we also determined a significantly greater history of disease in families of patients who had attempted suicide compared to those who had not.

Various studies have reported an association between alcohol and substance misuse or addiction and suicidal behavior in schizophrenia patients; many of these studies identified alcohol or multiple substance use as a significant risk factor for suicidal behavior in schizophrenia (Altamura et al. 2003). Due to the low level of alcohol and substance users in the sample investigated in this study, no difference could be determined between the groups in terms of alcohol and substance use. In addition, smoking levels in this study were significantly higher among patients with histories of attempted suicide compared to those without. Kristal et al. (1999) reported that

nicotine can be misused in schizophrenia patients for specific reasons such as its increasing emotionality or a common genetic predisposition to schizophrenia and nicotine dependence, or for non-specific reasons, such as the rewarding effect of the substance, its leading to a decrease in extrapyramidal symptoms and its exhibiting positive effects on mood and cognition. Additionally, it has been suggested in studies that a simultaneous diagnosis of nicotine addiction can be described as a form of biological subtype associated with more severe clinical symptoms and very likely a poor outcome of schizophrenia and an increased risk of suicide (Altamura et al. 2003). The data from this study support those findings.

In terms of disease histories, duration of disease in patients with histories of attempted suicide was significantly longer than those of patients with no history of attempted suicide. In terms of histories of disease in studies to date, suicidal behavior has been associated with an early age of onset (Müller et al. 2005) and an increased number of hospitalizations (Özcüler 2004). In this study, duration of disease was longer in patients with histories of attempted suicide than those with no such history.

The schizophrenia sample group investigated in this study was under monitoring with manifestations of remission, and no statistical significance was observed between the two groups in terms of PANSS scale scores when disease symptoms were evaluated. In addition, although patients diagnosed with depressive disorder by the application of SCID-1 were excluded, scores on CDSS, which screens for depression symptoms, were significantly higher in patients with histories of attempted suicide than those without. Previous studies have reported that depressive symptoms are a significant predictor of suicidal behavior (Challis et al. 2013, Palmier-Claus et al. 2013, Sanchez-Gistau et al. 2013, Togay et al. 2015). One study investigating predictors of suicide in patients with schizophrenia spectrum and mood disorders reported that the presence of a primary mood disorder, history of attempted suicide, and material losses or the death of family members led to a higher level of attempted suicide (Gallegeo et al. 2015). Additionally, the presence of a depressive dimension has been reported to be a significant risk factor in patients with schizophrenia, with depressive symptoms being seen in up to 30% of schizophrenia patients attempting suicide (Mauri et al. 2013). In addition, it has been suggested that depressive disorder seen in schizophrenia patients is significant as a trigger of disposition to suicidal behavior (Schennach et al. 2011). A previous or current history of depressive disorder in schizophrenia patients is reported to be closely correlated with suicide (Hawton and James 2005). In this study, current depressive symptoms were greater in patients with histories of attempted suicide than those with no such history. These data show the critical importance of depressive symptoms to the risk of suicide in patients with schizophrenia and that

depressive characteristics in this patient group need to be very carefully assessed (Mauri et al. 2013).

In terms of quality of life and social functioning, significantly lower levels of social engagement were observed in patients with histories of attempted suicide than in those without. In support of these findings, one piece of research investigating clinical variables associated with suicide in schizophrenia showed poor general and occupational functioning in patients who had attempted suicide before initial presentation (Togay et al. 2015). Additionally, another study of schizophrenia patients showed that quality of life affects suicidal ideation (Yan et al. 2013). A study from Turkey reported that increased quality of life following psychosocial skills training in patients with schizophrenia might be associated with a reduced risk of suicide (Deveci et al. 2008). These findings point to a relation between suicidal behavior seen in schizophrenia patients and quality of life and social functioning. Additionally in this study, correlation analysis between the scales was performed in both the suicide attempt and non-suicide attempt groups. No statistically significant findings emerged from correlation analysis between the scales in the group with no history of attempted suicide. In the group with a history of attempted suicide, however, a significant negative correlation was observed between CDSS and Q-LES-Q and the SFS "Independence level/Performance" subscale, and a significant positive correlation was observed with the UKU 'Neurological' subscale. In previous studies, negative symptoms and depression have been shown to be predictive agents for well-being in schizophrenia patients (Strauss et al. 2012), while a lower level of depression symptoms and better quality of life in schizophrenia patient may predict early cure (Naber et al. 2013). These findings were also in agreement with other studies (Kao et al. 2011, Renwick et al. 2012). Acceptance of the disease, adaptation to the disease, and depression have been shown to affect quality of life (Badura et al. 2012). In contrast to these findings, Dan et al. (2011) observed no association between depression and quality of life in schizophrenia patients. It has been suggested that the variation in these findings may be due to cultural differences, methodological differences, sample size, variation in demographic characteristics, or differences between the scales used (Sharh et al. 2016).

It can be suggested that patients with a history of suicide attempts exhibit a lower quality of life and social functioning performance and a higher incidence of neurological adverse effects of medications in comparison to those without a history of any suicide attempts. Indeed, previous research in the literature in agreement with these findings has noted an association between depressive symptoms and suicidal behavior, impaired quality of life, and impoverishment of social functioning in patients with schizophrenia (Hausmann and Fleischhacker 2002).

Based on the results of this observational study, in sociodemographic terms a higher level of family history of psychiatric disease, higher total duration of disease, and smoking were observed in schizophrenia patients with histories of attempted suicide than in those with no such history. In terms of clinical features, it may be suggested that the presence of a history of attempted suicide in schizophrenia patients is associated with higher depressive symptoms, lower quality of life that is negatively correlated with depressive symptoms, and a lower level of social functioning.

In the light of the data from this study, we recommend that patients with histories of attempted suicide also be considered by taking these clinical characteristics into account, and that additional therapeutic and social support programs be developed directed toward these factors that may also affect the clinical course.

The small sample size in this study, the fact that patients were evaluated cross-sectionally at clinic check-ups, and that longer-term monitoring was not performed may be regarded as limitations of this study. In addition, similar to previous studies concerning suicide, the fact that not all suicide attempts, particularly successful ones, could be included may be considered another limitation. Relationships between the scales in this study were revealed using correlation analysis. However, correlation analysis may be insufficient to demonstrate causality, and we suggest that these findings be regarded as preliminary due to the relationships shown.

Suicidal behavior is the most common cause of early death among patients with schizophrenia. Further large-scale, long-term, and prospective studies are now needed to determine how suicidal behavior affects clinical course and severity in these patients and measures that might be taken under such conditions.

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