

# Demographic and clinical characteristics in schizophrenia: A multicenter cross-sectional case record study

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## Abstract

**Objective:** The aim of the present study is to assess the relationship between demographic characteristics and suicide attempts, physically aggressive behavior, substance abuse, repeated hospitalizations, and continuous illness course .

**Method:** The medical records of patients from three different treatment centers were assessed. The relationship between demographics and clinical characteristics were assessed. Logistic regression analysis was conducted to determine the predicting factors for suicide attempts, physically aggressive behavior, heavy smoking, repeated hospitalizations, and continuous illness course.

**Results:** The medical records of a total of 720 patients with schizophrenia were assessed. Of these patients, 68% were never married, 56% were unemployed, and 69% were living with their parents. 35% of the patients had a relative diagnosed with a psychotic disorder. The mean age for the onset of the illness was found to be 23.5, with no difference between females and males. 50% of the patients had had repeated hospitalizations. The duration of untreated psychosis was 10.8 months and 28% of the patients had been through a continuous course of the illness. 57% of the patients were found to be regular smokers; 55% of the patients had physically aggressive behavior; 52% had experienced a suicidal ideation and attempt; 28% had made at least one suicide attempt. The percentage of patients having had a legal issue related to their illness was 11%. Heavy smoking was predicted with the continuous illness and male gender. Physically aggressive behavior was predicted with suicide ideation and attempts, being single, having insufficient family support, and having undergone frequent hospitalization. Repeated hospitalizations were predicted with suicide attempts and having a legal problems; continuous course of illness was predicted with being unemployed and lack of family support; suicide attempt was predicted with duration of the illness.

**Conclusion:** When both sexes were compared, the lack of difference at the onset of disease between the two suggests that there might be other factors playing a role in this phenomenon. The relationship between suicidal ideation and behavior and physical aggressive behavior, indicates that these two might share common underlying mechanisms. Possible significant relationships between demographic and clinical characteristics should be kept in mind for the prevention, treatment, and rehabilitation approaches in dealing with schizophrenia.

**Key Words:** Schizophrenia, Demographics, Age of onset, Smoking, Hospitalization, Untreated illness duration, Prognosis, Suicide attempt, Physically aggressive behavior.

## INTRODUCTION

Schizophrenia is a serious mental disorder that starts at early ages. Although it has a chronic and repetitive nature and its frequency is low, it has a relatively higher prevalence. With a generally accepted lifetime prevalence

of 0.5-1.6%, schizophrenia is one of the conditions that cause the greatest burden to families and society because it often leads to mental or social disability (Rössler et al. 2005). Assessment of the demographic and clinical characteristics of schizophrenia patients makes a great contri-

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bution towards understanding this disease and developing new treatment/management tactics. Despite all the difficulties posed by epidemiological studies of schizophrenia (it is known that some patients stay off record), data obtained from field studies and patients on-record are considered to be important sources of information (Eaton and Chen 2006).

Various important clinical phenomena encountered during the course of schizophrenia entitle this disease to have emphasis on its reflections on the individual, family and the society. In addition to new attacks and hospitalizations, suicide attempts, aggressive behavior, substance use and the presence of continuous or residual symptoms are factors that increase the seriousness of this disease. Examining these clinical characteristics in themselves, and with demographic characteristics, contributes immensely to the development of an understanding of methods for prevention and treatment or management.

It is accepted that schizophrenia is seen at equal rates in both sexes. Although, in general there are studies indicating the onset of the disease to be 3-4 years earlier in males (Jablensky et al. 1992, Häfner et al. 1998, Ran et al. 2003, Tang et al. 2007), other studies also exist which show the opposite relationship or no difference between the sexes (Folnegovic and Folnegovic-Smalz 1994, Wiselgren and Lindstrom 1996). In various studies, from the time when initial positive symptoms of the disease emerge, the time it takes to apply for initial treatment is reported as being between 2.5 to 40 months. In general, a time period of 6-12 months is accepted (Larsen et al. 2001, Häfner 2003, Alptekin et al. 2005, Schimmelmann et al. 2008). Most patients, at some period during the illness (when acute attack, relapse, recurrence, suicide attempts or aggressive behavior occur), require hospitalization. The frequency and duration of patient hospital stays vary depending on the country, and even from one region to another within the same country, based on outpatient facilities, the social security system, social support and family, in addition to the severity of the disease (Knapp et al. 2002, Lay et al. 2006).

In schizophrenia, suicide is one of the important factors in reducing the life expectancy (Limosin et al. 2007). While a significant portion of patients carry thoughts of suicide, a significant number (18-55%) are reported to have attempted suicide at least once (Roy 1986, Gupta et al. 1998, Meltzer 2002). In schizophrenia, the death rate from suicide attempts is estimated to be 5.6% (Palmer et al. 2005). The risk of suicide is higher at the onset of the disease or after the first hospitalization (Palmer et

al. 2005). Factors such as co-morbid depressive disorder, being of a young age, being of the male sex, having a tendency towards substance use, having made previous suicide attempts and having recently being discharged from hospital are reported to increase the risk of suicide (Siris 2001).

Violent behavior is not a rare occurrence in schizophrenic patients. After alcohol/substance use and antisocial personality disorder, schizophrenia is the mental illness that is most associated with violent behavior (Marzuk 1996). In adult schizophrenic patients, 6-month prevalence of aggressive behavior was reported to be 19% (Swanson et al. 2006). In schizophrenia, various types of temporary or repetitive violent behavior (verbal, physical, instrumental or not) towards objects or people, acquaintances or strangers are observed. Due to physically aggressive behavior, 8% of these patients had legal problems (Wallace et al. 2004). Over the lifespan of a patient, generally, the rate of criminal convictions for any reason is reported to be 21% (Wallace et al. 2004). The presence of positive symptoms, acute episodes, treatment noncompliance, a history of violence and substance abuse increase the risk for aggressive behavior (Swartz et al. 1998, Swanson et al. 2006, Bobes et al. 2009). It is reported that aggressive behavior decreases with age in schizophrenia (Hafner 2003).

Cigarettes are the most frequently used substance by patients with schizophrenia. The ratio of smokers is reported to be 56-88% (Kendler et al., 1996; Dalack et al., 1998). Studies from various countries have shown that cigarette consumption during schizophrenia is independent of social and cultural factors (de Leon and Diaz, 2005; Campo-Arias et al., 2006). Cigarette consumption was found to be more related to the early onset of the illness and frequent hospitalizations (Kelly and McCreadie 1999, Aguilar et al. 2005, Patkar et al. 2002). In schizophrenia, other substances used apart from cigarettes, given in order of frequency of use are; alcohol, marijuana, amphetamines and cocaine (Mueser et al. 1990, Kendler et al. 1996).

Despite all the treatment options for schizophrenia, there is a significant patient group where symptoms persist. Approximately two thirds of patients were observed to lead their lives with permanent, positive or negative symptoms (Hegarty et al. 1994, Heiden and Hafner 2000, Harrison et al. 2001). This proportion indicates that the present treatment of schizophrenia is not sufficient and that new treatment opportunities are necessary.

In our country, no multi-centered field study about

schizophrenia has been done. There are studies examining the demographic and clinical characteristics of schizophrenia patients who had outpatient or inpatient treatment, and findings usually show similarities with those published in foreign publications. The goal of our study is to assess the relationship between the demographic characteristics of schizophrenic patients in Turkey and suicide attempts, physically aggressive behavior, substance use, hospitalizations and prognosis.

## METHODS

The study was conducted in three centers (Kocaeli University Faculty of Medicine Psychiatry Outpatient Clinic Psychosis Unit, Bakırköy Mental and Neurological Diseases Training and Research Hospital, Day Hospital and Rehabilitation Center, and 19 Mayıs University Faculty of Medicine Psychiatry Outpatient Clinic Psychosis Unit) between the dates of March 1, 2006 and March 1, 2008. All three centers specialize in the treatment of patients with psychotic disorders. At these centers, patients were evaluated by psychiatry assistants and supervised by an expert, using a common interview form. Patients who had applied to the outpatient clinic for the first time, who were diagnosed with schizophrenia according to the DSM-IV (APA, 1994), who were above the age of 18 and whose records were confirmed by consulting at least one of the patient's relatives, were included in the study.

The demographic and clinical characteristics of the patients were examined in two parts. The first part consisted of demographic information. The patient's sex, level of education, marital status (married, single, separated, divorced or widowed), work or occupational status (unemployed, working - worker, civil servant, self-employed, student, farmer, homemaker -, retired), economic status (income per capita per month), life style (with parents - mother, father or siblings -, partner or children, friends or relatives, alone, at a shelter), support provided by the family (full, partial sufficient, none), history of psychotic illness in the family and the age of onset of the illness. History of psychotic illness in the family was defined as the presence of any other person with a psychotic disorder (schizophrenia, schizophreniform disorder, schizoaffective disorder, and delusional disorder) in first, second and third degree relatives.

In the second part, clinical characteristics were examined: the length of illness (time elapsed from the time of the initial occurrence of psychotic symptoms until the time of the interview, in years), number of hospitaliza-

tions, total length of stay during hospitalizations (sum of all hospitalizations during the illness, in days), time until first treatment of illness (duration of untreated psychosis, in months), prognosis (based on the DSM-IV; first episode, single episode in full remission, single episode in partial remission, episodic with no interepisodic residual symptoms, episodic with interepisodic residual symptoms, continuous), subtype of schizophrenia (paranoid, undifferentiated, disorganized, residual, catatonic), daily cigarette consumption, thoughts and attempts at suicide after the illness, physically aggressive behavior after the disease (presence of violent behavior at a level where it causes significant damage to objects or people) and criminal convictions after falling ill.

## Data analysis

Initially, the data was presented as descriptive statistics. Since the continuous variables did not fit in the normal distribution they were analyzed using the Mann-Whitney U test and categorical variables were compared using the Chi-Square test. Data was re-grouped based on several variables. Groups were further divided into two sub-groups as follows; marital status as 'married before' and 'never married', occupation as 'unemployed' and 'other', lifestyle as 'living with parents' and 'other', family support as 'complete support' and 'none', daily cigarette consumption as 'heavy smoker' (more than two packages) and 'other', hospitalization as 'repeated hospitalizations' and 'other', sub-type of illness as 'paranoid' and 'other', course of the disease as 'continuous' and 'other'. In order to determine variables that are predictive of continuity of the disease, suicide attempts, physically aggressive behavior, repetitive hospitalizations and heavy cigarette consumption, the Logistic Regression Analysis "Enter" method was used.

## RESULTS

In the study, data from a total of 720 patients was examined. The distribution of patients, based on the centers, was as follows; Kocaeli University Faculty of Medicine Psychiatry Outpatient Clinic Psychosis Unit: 420 patients, Bakırköy Mental and Neurological Diseases Training and Research Hospital, Day Hospital and Rehabilitation Center: 200 patients, and 19 Mayıs University Faculty of Medicine Psychiatry Outpatient Clinic Psychosis Unit: 100 patients. The number of patients seen at all three centers, at the same time was 492, 252 and 165, respectively. Thus, 79.2% of schizophrenia patients, evaluated consecutively in the outpatient centers, were included in the assessment.

TABLE 1. Demographic data of schizophrenia patients (n:720)

Features	Total (n=720, %100)	Male (n=362, %50.3)	Female (n=358, %49.7)	Statistics
Age (mean± SD)	35.5 ± 11.0	34.3 ± 10.5	36.7 ± 11.3	p=0.003 <sup>a</sup>
Education level* (mean±SD)	8.7 ± 3.9	9.0 ± 3.7	8.5 ± 4.1	NS <sup>a</sup>
Economic level** (mean±SD)	283.56 ± 257.62	233.10 ± 266.23	294.14 ± 248.58	NS <sup>a</sup>
Marital status (n, %)				NS <sup>b</sup>
Single	487 (67.6)	247 (68.2)	240 (67.0)	
Divorced, Separated	64 (8.9)	34 (9.4)	30 (8.4)	
Married	136 (18.9)	67 (18.5)	69 (19.3)	
Widowed	33 (4.6)	14 (3.9)	19 (5.3)	
Occupation (n, %)				NS <sup>b</sup>
None	402 (55.9)	215 (59.4)	187 (52.4)	
Working***	239 (33.2)	112 (30.9)	127 (35.6)	
Retired	78 (10.8)	35 (9.7)	43 (12.0)	
Life style (n, %)				NS <sup>b</sup>
With parents	495 (68.8)	253 (69.9)	242 (67.6)	
With spouse or children	166 (23.1)	75 (20.7)	91 (25.4)	
Friend/ relative	23 (3.2)	13 (3.6)	10 (2.8)	
Alone	34 (4.7)	19 (5.2)	15 (4.2)	
Shelter	2 (0.3)	2 (0.6)	0 (0.0)	
Family support (n, %)				NS <sup>b</sup>
Full	497 (69.0)	241 (66.6)	256 (71.5)	
Partially sufficient	186 (25.8)	101 (27.9)	85 (23.7)	
None	37 (5.2)	20 (5.5)	17 (4.7)	
Family history of psychosis (n, %)	251 (34.9)	127 (35.1)	124 (34.6)	NS <sup>b</sup>
Age of onset of disease (mean±SD)	23.5 ± 7.4	23.4 ± 7.1	23.6 ± 7.8	NS <sup>a</sup>

\* Grade completed successfully

\*\* Monthly average income of family, per capita (TL)

\*\*\* Worker, civil servant, house wife, self-employed, farmer and student were included in this class s

NS: Not significant

<sup>a</sup> Mann-Whitney U test

<sup>b</sup> Chi-Square test

Demographic characteristics of the patients are summarized in Table 1. Patients' sex proportions were equal. The ages of female patients were higher than those of male patients. Aside from age, no other significant difference between the sexes was determined based on demographic characteristics. The age of onset of the illness was not different in males and females (Figure 1). In 66.3% of patients (M: 68.0%, F: 64.5%), the age of onset was between 15 and 25. The ratio of patients with an age of onset of 15 years or less was 3.6% in both males and females. The ratio of patients with an age of onset of 25 years or more was 31.8% in females and 28.5% in males.

The disease and prognostic characteristics of patients are summarized in Table 2. The length of illness for women was longer than those for men. Although the number and length of hospitalizations of women are a bit higher compared to those of men, the difference was not significant. Duration of untreated psychosis was shorter in men. Daily cigarette consumption, physically aggressive

behavior, suicide ideation and attempts, and criminal convictions were higher in men compared to women. It was determined that 27.4% of patients (n=197) were never hospitalized, whereas 49.9% (n=359) had been through repeated hospitalizations (two or more).

Besides cigarettes, current use of other substances was relatively low. In 12 patients (1.7%) alcohol dependence, in 6 patients (0.8%) marijuana dependence, in 4 patients (0.6%) biperiden dependence and in 3 patients (0.4%) benzodiazepine dependence were determined. These numbers were not included in the analysis.

The relationship between physically aggressive behavior (n=341), suicide attempts (n=199), heavy cigarette consumption (n=63), continuity of the illness (n=204), repeated hospitalizations (n=359) and family history of psychosis (n=251) determined in patients with schizophrenia and other variables, were analyzed using the Chi-Square and Mann-Whitney U tests.

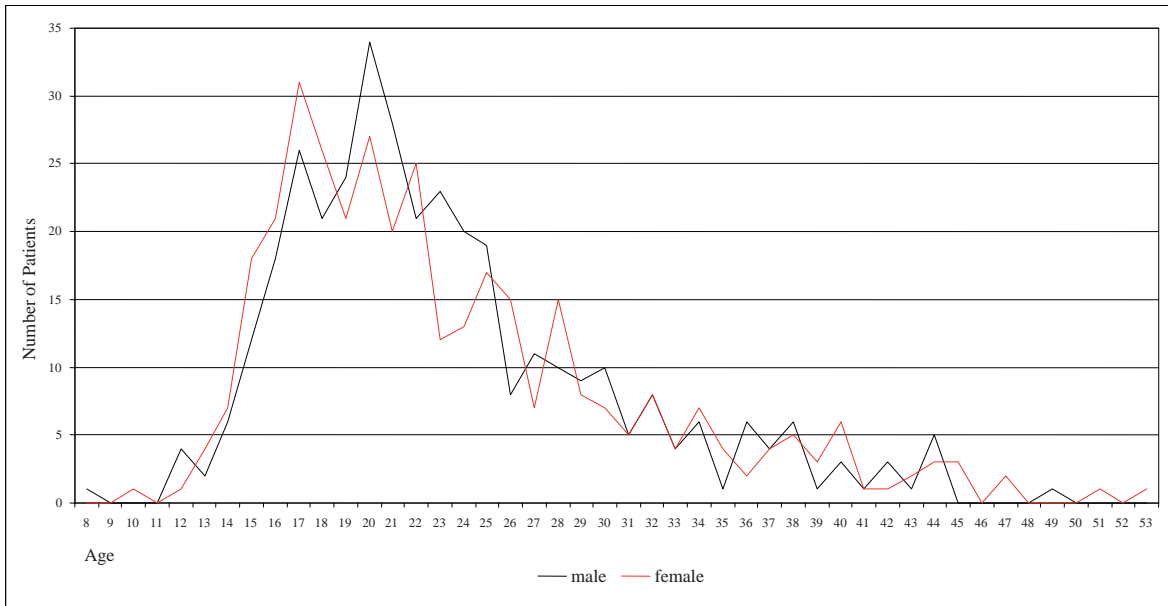


FIGURE 1. In schizophrenia patients (n=720), the age of onset based on sex.

TABLE 2. In schizophrenia patients (n:720) some features of the illness and its prognosis

Features	Total (n=720, %100)	Male (n=362, %50.3)	Female (n=358, %49.7)	Statistics
Length of hospitalization (year) (mean±SD)	12.0 ± 9.0	10.9 ± 8.6	13.1 ± 9.3	p=0.001 <sup>a</sup>
Number of hospitalizations (mean±SD)	2.5 ± 3.4	2.3 ± 2.8	2.7 ± 3.8	NS <sup>a</sup>
Length of hospitalization (day) (mean±SD)	71.3 ± 126.5	61.9 ± 86.5	80.7 ± 156.5	NS <sup>a</sup>
DUP* (month) (mean±SD)	10.8 ± 21.9	8.6 ± 16.8	12.9 ± 25.8	p=0.023 <sup>a</sup>
Daily cigarette consumption** (n, %)				p=0.021 <sup>b</sup>
None	312 (43.3)	141 (39.0)	166 (46.4)	
20↓	171 (23.8)	90 (24.9)	81 (22.6)	
21-40	174 (24.2)	86 (23.8)	88 (24.6)	
41↑	63 (8.8)	45 (12.5)	23 (6.4)	
Physically aggressive behavior (n:620) (n, %)	341 (55.0)	189 (61.2)	152 (48.9)	p=0.002 <sup>b</sup>
Suicide ideation and attempt (n, %)	373 (51.8)	203 (56.1)	170 (47.5)	p=0.021 <sup>b</sup>
Suicide attempt (n, %)	199 (27.6)	101 (27.9)	98 (27.4)	NS <sup>b</sup>
Criminal conviction (n, %)	80 (11.1)	54 (14.9)	25 (7.0)	p=0.002 <sup>b</sup>
Sub-type (n, %)				NS <sup>b</sup>
Paranoid	449 (62.4)	241 (66.6)	208 (58.1)	
Undifferentiated	188 (26.1)	90 (24.9)	98 (27.4)	
Residual	49 (6.8)	16 (4.4)	33 (9.2)	
Disorganized	34 (4.7)	15 (4.1)	19 (5.3)	
Prognosis (n, %)				NS <sup>b</sup>
First episode	31 (4.4)	20 (5.5)	11 (3.1)	
Single episode in full remission	32 (4.4)	12 (3.3)	20 (5.6)	
Single episode in partial remission	68 (9.4)	39 (10.8)	29 (8.1)	
Episodic with no interepisode residual symptoms	153 (21.3)	66 (18.2)	87 (24.3)	
Episodic with interepisode residual symptoms	232 (32.2)	118 (32.6)	114 (31.8)	
Continuous	204 (28.3)	107 (29.6)	97 (27.1)	

\* DUP: Duration of untreated psychosis

\*\* Mean in men 22.6 ± 19.4, in women 17.7 ± 16.7, z = -2.709, p=0.007.

NS: Not significant

<sup>a</sup> Mann-Whitney U test

<sup>b</sup> Chi-square test

The presence of physically aggressive behavior was found to be associated with the following variables: suicide ideation and attempts ( $\chi^2=33.324$ ,  $p=0.001$ ), suicide attempts ( $\chi^2=8.253$ ,  $p=0.004$ ), criminal convictions ( $\chi^2=22.410$ ,  $p=0.001$ ), type of disease (higher in non-paranoids) ( $\chi^2=5.671$ ,  $p=0.017$ ), continuity of the illness ( $\chi^2=8.300$ ,  $p=0.004$ ), male sex ( $\chi^2=9.460$ ,  $p=0.002$ ), marital status (higher in singles) ( $\chi^2=7.137$ ,  $p=0.008$ ), insufficiency of family support ( $\chi^2=10.852$ ,  $p=0.001$ ), education level (low) ( $z=-3.199$ ,  $p=0.001$ ), economic level (low) ( $z=-4.094$ ,  $p=0.001$ ), daily cigarette consumption (excessive) ( $z=-3.269$ ,  $p=0.001$ ), number of hospitalizations (excessive) ( $z=-3.157$ ,  $p=0.002$ ) and days of hospitalization (excessive) ( $z=-2.835$ ,  $p=0.005$ ).

Suicide attempts of patients were found to be associated with the following variables: length of illness (excessive) ( $z=-2.285$ ,  $p=0.022$ ), number of hospitalizations (excessive) ( $z=-4.458$ ,  $p=0.001$ ) and days of hospitalization (excessive) ( $z=-4.789$ ,  $p=0.001$ ).

Heavy cigarette consumption was found to be associated with the following variables: continuity of illness ( $\chi^2=14.814$ ,  $p=0.001$ ), physical violent behavior ( $\chi^2=6.915$ ,  $p=0.009$ ), non-paranoid schizophrenia type ( $\chi^2=5.090$ ,  $p=0.024$ ), male sex ( $\chi^2=8.924$ ,  $p=0.003$ ), age (high) ( $z=-4.079$ ,  $p=0.001$ ), length of illness (excessive) ( $z=-4.120$ ,  $p=0.001$ ), number of hospitalizations (excessive) ( $z=-3.522$ ,  $p=0.001$ ) and days of hospitalizations (excessive) ( $z=-2.744$ ,  $p=0.006$ ).

The continuity of the illness was found to be associated with the following variables: physically aggressive behavior ( $\chi^2=8.300$ ,  $p=0.004$ ), insufficiency of family support ( $\chi^2=34.454$ ,  $p=0.001$ ), occupational status (unemployment) ( $\chi^2=18.108$ ,  $p=0.001$ ), age (high) ( $z=-4.214$ ,  $p=0.001$ ), education level (low) ( $z=-4.652$ ,  $p=0.001$ ), non-paranoid schizophrenia type ( $\chi^2=47.132$ ,  $p=0.001$ ), length of illness (excessive) ( $z=-5.664$ ,  $p=0.001$ ), number of cigarettes consumed daily (excessive) ( $z=-3.385$ ,  $p=0.001$ ) and duration of untreated psychosis (excessive) ( $z=-3.759$ ,  $p=0.001$ ).

Repeated hospitalizations were found to be associated with the following variables: age of the patient (high) ( $z=-8.041$ ,  $p=0.001$ ), marital status (married) ( $\chi^2=5.577$ ,  $p=0.018$ ), age of onset of disease (young) ( $z=-11.947$ ,  $p=0.001$ ), physically aggressive behavior ( $\chi^2=7.207$ ,  $p=0.007$ ), suicide attempts ( $\chi^2=14.410$ ,  $p=0.001$ ), criminal convictions ( $\chi^2=18.757$ ,  $p=0.001$ ) and non-paranoid disease type ( $\chi^2=11.327$ ,  $p=0.001$ ).

A family history of psychosis was not found to be associated with any variables except the age of onset of the illness. In patients with a family history of psychosis, an earlier age of onset ( $22.8 \pm 7.0$  and  $23.9 \pm 7.6$ ,  $z=-2.185$ ,  $p=0.029$ ) of the disease was determined.

In order to determine predictive factors for suicide attempts, physically aggressive behavior, heavy cigarette consumption, continuity of the illness and repeated

TABLE 3. Factors that predict physical aggression, suicide attempt, heavy cigarette consumption, disease continuity, and repeated hospitalizations in schizophrenia patients

Features	Variables	P	Exp ( $\beta$ )	%95 CI
Physically aggressive behavior <sup>a</sup>	Number of hospitalizations	0.012	1.118	1.025-1.219
	Suicide ideation and attempt	0.001	3.169	2.037-4.929
	Marital status (Single)	0.002	1.807	1.239-2.636
	Insufficient family support	0.011	1.669	1.123-2.482
	Education level	0.045	0.950	0.904-0.999
Suicide attempt	Duration of illness	0.020	1.096	1.015-1.184
Heavy cigarette consumption	Number of hospitalizations	0.036	1.203	1.013-1.430
	Sex (male)	0.006	2.443	1.286-4.644
Continuity	Unemployment	0.007	2.127	1.233-3.670
	Insufficient family support	0.001	2.309	1.412-3.773
	Low education level	0.005	1.019	1.006-1.032
	Daily cigarette consumption	0.005	1.019	1.006-1.032
Repeated hospitalization <sup>b</sup>	Age	0.001	1.109	1.081-1.138
	Age of onset	0.001	0.892	0.862-0.924
	Suicide attempt	0.005	1.763	1.184-2.625
	Criminal conviction	0.006	2.387	1.289-4.421

<sup>a</sup>Criminal conviction was not added as a covariate. <sup>b</sup>Length of hospital stay was not added as a covariate.

hospitalizations of patients, the significant relationships determined above were re-examined using logistic regression (Enter Method) analysis. Since family history of psychosis was found to be significant in only one variable, it was not included in the logistic regression. The relationships found to be significant as a result of regression analysis are summarized in Table 3.

## DISCUSSION

In our study, where the ratio of females to males was equal and no difference between sexes were observed based on age, onset of disease, education level, rate of unemployment, monthly income per person in the family, living with family and history of psychosis in the family, the data obtained uncovered significant results. When evaluated based on demographic features, it was found that variables of age, sex, education level, marital status, occupational status and family support had an effect on aggressive behavior, heavy cigarette consumption, continuity of disease and repeated hospitalizations.

### Family history of psychosis

Besides a slightly earlier age of onset of disease, the existence of a psychotic disorder in the family did not have a significant effect on the clinical characteristics. When compared with other studies, the presence of history of psychotic disease in families in our study seems slightly higher. In a study by Belli et al. (2007) (n=463) (without stating the degree of relatives), this rate was 26%. In another study by Tang et al. (2007) (n=542), the rates were 11% for women and 14% for men. The reason for slightly higher rates in our study may be due to the inclusion of second and third degree relatives.

### Age of disease onset

The age of illness onset (when the first psychotic symptoms occur) was almost the same for men and women (23.4 and 23.6, respectively). The most frequent age of onset groups are very similar in both sexes, as it can also be seen in the graphics found in Figure 1. In a multi-centered study (n=382) conducted in Turkey, the age of onset was reported as 22.6 (difference between genders was not considered) (Alptekin et al. 2005). In their study, Belli et al. (2007) determined that the age of onset in men was 23.8 and in women, it was 27.6. In another study (n=274), Sarandöl et al. (2007) reported the age to be 23.8 in men and 26.1 in women. In their study (n=502), Karşıdağ et al. (2005) also reported similar numbers (23.3 in men and 25.1 in women).

The generally accepted opinion for the age of onset of the disease is in the following form, where men start 3-4 years earlier than women (26.7 in men, 30.1 in women) (Jablensky et al. 1992, Häfner et al. 1998, Ran et al. 2003), it peaks at a later age in women due to the protective effect of estrogen (Riecher-Roessler et al. 1994) and evens out in advanced age. In familial schizophrenia assessments, the difference between sexes, based on the age of onset, was shown to disappear (Kendler ve Walsh, 1995, Gorwood et al. 1995, Könnecke et al. 2000, Tang et al. 2007).

In contrast to the general opinion that the age of onset is earlier in men compared to women, there are also studies indicating that there is no difference in age between sexes (n=120) (Wieselgren and Lindstrom 1996), (n=679) (Folnegovic and Folnegovic-Smalz 1994), and that earlier onset is in favor of women (n=200) (Murthy et al. 1998). The fact that our study did not observe an age difference between the sexes and taking into consideration other studies showing results different from the common opinion, it indicates that the age of onset of schizophrenia may not be the same in all countries and cultures (Hafner 2003), and that further investigation of the roles played by other factors is necessary.

### Duration of untreated psychosis

In our patient group, the duration of untreated psychosis (DUP) was found to be 10.8 months. The other studies conducted in Turkey report this period to be quite similar, 6 months (Üçok et al. 2004) and 10.8 months (Alptekin et al. 2005). While in an initial episode study, Häfner (2003) reports this period to be 15 months, Bromet and Fennig's (1999) study show an average of 8 months, where this period was found to be shorter in men (6 months) compared to women (11 months). Similarly, in our study also, the DUP was found to be shorter in men (8.6 months) compared to women (12.9 months).

The duration of untreated psychosis is generally found to be significant in respect to the negative prognosis of the disease (Wyatt et al. 1998). The continuity of the disease may indicate negative prognosis. In our study, the significant relationship between DUP and disease continuity, present after the binary comparison, disappeared after regression analysis. Possibly, other factors play a greater role in the continuity of the disease. The predictive power of our study is considered weak since it is not a long-term prognosis study.

## Hospitalizations

Hospitalizations had not been experienced by all the 720 patients observed. Among the patients, 27% had been assessed through outpatient clinics without any hospitalizations. For patients whose average length of illness was 12 years, the average number of hospitalizations was 2.5 and the average length of each stay was 71 days. Based on this (71:2.5) the average length of each hospitalization can be stated as 28 days. The frequency of hospitalization was affected by the age of the patient and the age of onset of the disease. Early onset of the disease and long-lasting bouts increased the risk of repeated hospitalizations. The great predicting factors for repeated hospitalizations were suicide attempts ( $\beta$ :1.76) and criminal convictions ( $\beta$ :2.39). The rate and length of hospitalizations of schizophrenia patients can be affected by other factors such as economic level, health insurance, family problems, health system accessibility, outpatient facilities and social supports (Lay et al. 2006, Fortney et al. 2009). Although, in our county, there have been no studies regarding this aspect, it is known that, over the years, the length of hospitalizations of schizophrenia patients decreases. For instance, in Switzerland, while the average length of hospitalization was 47 days in 1977, this rate had fallen to 23 days by 2004 (Lay et al. 2007). Social psychiatry practices and new treatment options are known to have contributed to this decrease (Honkonen et al. 2003). However, the decrease in the length of stay at the hospital does not indicate a decrease in the total length of hospitalization for a patient. In a study, comparing hospitalizations from the 70's and 90's showed that, although the length of hospitalizations decreased in later years, the total days of hospitalization did not change much (Goldstein and Shemansky 2000).

Similar to our results, the number of hospitalizations was found as 3 times with an average illness duration of 15 years in a study conducted in China (Tang et al. 2007) and there was not any difference between men and women based on the number of hospitalizations. In our patient group, a difference in the number of hospitalizations or the total number of days of stay was not determined either. Only the duration of illness was longer in women compared to men. This situation is explained by women being older than men. In other studies conducted in Turkey, average hospitalizations are given as 1.2 and 3.7 (Sarandöl et al. 2007, Alptekin et al. 2005). Similarly, Sarandöl et al. (2007) did not discover any difference between men and women, regarding the number of hospitalizations.

This data can be particularly useful in cost-analysis studies. For studies that research the direct cost of schizophrenia, the number of hospitalizations possible for a patient and their possible length of stay during each hospitalization, provide important data for cost analysis studies.

## Suicide attempts

After falling ill, suicidal ideation and suicide attempt rate was determined to be 52% and the rate of attempting suicide at least once was 28%. The rate of those who have experienced suicide ideation without making any attempts is 24%. While no difference is found in the frequency of suicide attempts between males and females, suicide ideation and attempts were determined to be more frequent in males. In a study by Karşıdağ et al. (2005), suicide attempts was reported to be at a rate of 21%. Similarly, in other studies, rates of life time suicide attempts in schizophrenia patients were reported to be 24%, 27% and 29% (Bromet and Fennig 1999, Radozsky et al. 1999, Gupta et al. 1998, respectively). In another study (n=454), Radozsky et al. (1999) did not determine any differences between the sexes regarding suicide attempts. In this study, the suicide ideation rate (26%) is very close to the rate from our study.

In the present study, the duration of illness was the predictive factor for suicide attempt ( $\beta$ :1.10). The lack of difference between the sexes and the unaffected age of onset give different results from other studies. Since the substance dependence rate is low in our patients, it was not possible to interpret this issue. As the duration of disease increases, suicide risk also increases. In schizophrenia patients, suicide is known to occur in the early stages of the disease (Siris 2001, Palmer et al. 2005). The rates from our study reflect the non-completed suicide rates and they are significant in showing the continued risk as the disease proceeds.

## Aggressive behavior and criminal conviction

In 55% of patients, aggressive behavior was observed at least once. In the patients of the study group, only violent behavior, at a level where it harmed other people or objects, was discussed. However, how much of this ratio relates to aggression towards objects and how much of it towards people is not known. Additionally, details of the aggressive behavior pattern were not examined in this study. Among the patients, the percentage holding a criminal record is 11%. In another study (Karşıdağ et al. 2005), examining inpatients in Turkey, percentage holding a criminal record was determined to be 18%.

This difference possibly reflects the distinction between inpatient and outpatient groups with respect to severity of the disease. The high rate of criminal convictions (21%), found in a study by Wallace et al. (2004) was associated with substance use. Among our patients, the level of substance abuse, with the exception of cigarette smoking, was determined to be low enough to be negligible although this rate does not reflect the lifelong rate. However, the very low prevalence of alcohol and substance dependence may suggest the probability of low, lifelong prevalence, too.

The factors that increase the risk of a patient showing aggressive behavior, in order of precedence, are: suicidal thoughts and attempts, being single, insufficiency of family support, number of hospitalizations and low education level. Epidemiological studies indicate that positive symptoms and acute episodes increase aggressive behavior whereas negative symptoms lead to its decrease (Swanson et al. 2006). Treatment non-compliance and substance abuse are associated with aggressive behavior (Swartz et al. 1998, Swanson et al. 2006). The association found between repeated hospitalizations and aggressive behavior, in our study, can be regarded as a supporting finding in respect to reflecting non-compliance with treatment and the increase in the severity of positive symptoms. The finding stating that suicide ideation and attempts increase the risk for physically aggressive behavior three times ( $\beta:3.17$ ) is remarkable. Further studies are necessary to evaluate this data.

In schizophrenia patients, it is known that aggressive behavior decreases with age (Hafner 2003). Although our study is not a follow-up study, no significant relationship was determined between physically aggressive behavior and age. It can be stated that factors other than age, increase the risk of physically aggressive behavior even more.

### **Substance use**

Among the patients, the rate of regular daily cigarette smoking is 57%, 9% consumes more than two packs. The rate and amount of cigarette smoking was higher in men compared to women. The rate of cigarette smoking among the patients is higher than that of the general Turkish population (29%) (Satman et al. 2002). Excessive smoking in males is also true for the general population. In our patient group, use of other substances was negligibly low. Karşıdağ et al. (2005) reported the rate of cigarette use in hospitalized patients as 72% and stated that it is higher in men than women. In the same study, in addition to cigarettes, alcohol use was reported

to be 25%, while the rate of marijuana and other substance use was 8%. The different results coming out of our study reflects the difference between inpatient and outpatient groups. In a study conducted with hospitalized patients in China (Tang et al. 2007), the rate of smoking was determined to be relatively lower. In this study, it was found out that men (52.0%) smoked more cigarettes compared to women (4.5%).

In our study, the number of hospitalization ( $\beta:1.20$ ) and the male sex ( $\beta:2.44$ ) were determined to be predictive factors for heavy cigarette smoking. In the current study, the finding that brings the male sex to the forefront, and its difference compared to other studies reporting the disappearance of the difference between sexes, as daily cigarette consumption increases (Brunette and Drake, 1997, Tang et al. 2007), raises the idea that other genetic and cultural factors may play a role in this case.

### **Prognosis**

A majority of schizophrenia patients continue to live their lives with symptoms. In our study, while 32% of patients showed episodic with interepisodic residual symptoms, 28% of them were assessed as continuous. Therefore, it can be stated that 60% of schizophrenia patients who are observed in outpatient facilities, continue to live with their symptoms. Our study is not a follow-up study. However, this finding is important since the prognoses from a great number of patients were evaluated.

Follow-up studies give similar rates. In the study by Huber et al. (1980), as a result of a 22 year follow-up, 22% of schizophrenia patients (n=502) had complete remission, 43% had partial remission and 35% were continuous. The rate of patients living with symptoms was reported as 78%, 30 years before. In the same study, prognosis was determined to be independent of the length of the disease. The independence of prognosis from illness duration is also highlighted in the meta-analysis study by Hegarty et al. (1994). In the studies from the 1990's, more positive results in the prognosis of the disease are reported. When the general clinical prognosis of the disease is assessed, a third reportedly have good results, whereas the remaining (60%) continues to have symptoms, without any difference between the genders (Harrison et al. 2001, Heiden ve Hafner 2000). Similarly, a difference between sexes was not observed in our patient group, either.

The continuity of the illness was found to be associated with unemployment, insufficient family support, low education levels and excessive cigarette consump-

tion. No relationship was determined between the continuity of the illness, and family history of psychosis and early onset of the disease. Our findings are consistent with studies reporting that hereditary disposition and the age of onset are not important for the outcome (Wieselgren ve Lindstrom 1996).

An important factor determining the prognosis is the type of onset of the disease. Insidious onset is known to be a negative factor in prognosis (Huber et al. 1980). During retrospective inquiries, it is hard to determine the type of onset of the disease due to the decreased credibility of the information. For this reason, in our study, we did not question the type of onset of the disease.

### Disease sub-types

In order of frequency, paranoid (62%), undifferentiated (26%), residual (7%) and disorganized (5%) sub-types were determined. In the patient group that was admitted for outpatient treatment, the catatonic sub-type was not present. In a study where ICD-10 diagnostic criteria were used (Tang et al. 2007), a similar distribution is reported. In this study, it was conspicuous that the rate of paranoid schizophrenia sub-type was higher in women (52%) compared to men (41%). Undifferentiated schizophrenia was determined to be at similar rates in both sexes (M: 31%, F: 32%). In our study, no difference was determined between sexes, based on schizophrenia sub-types. In a study, looking at hospitalized patients in Turkey, reported the rate of schizophrenia sub-types as; 42% paranoid, 27% undifferentiated, 23% disorganized, 7% residual and 2% catatonic (Karşıdağ et al. 2005). When compared with our study, the high occurrence of the undifferentiated sub-type and the presence of the catatonic type in this study can be explained as a reflection of the difference in hospitalized patients.

### Summary

The most important findings identified by the current study can be summarized as follows: (1) the age of

onset of the disease was not found to be different between males and females. (2) Approximately two thirds of patients are single, unemployed and live with their parents. In this respect, there is no difference between men and women. (3) Two thirds of the patients are living with continuous or residual symptoms. (4) At least quarter of the patients make a suicide attempt at some point in their lives. (5) Among the patients, a quarter had no history of hospitalizations, however, the general frequency of hospitalizations was 2.5 and each time the average stay was 28 days. (6) Besides cigarette use, other substance addictions were negligibly low. (7) Heavy cigarette consumption is associated with the number of hospitalizations and the male gender. (8) There is a strong relationship between physically aggressive behavior and suicide ideation/attempts, being single and having insufficient family support. (9) In the case of repeated hospitalizations, suicide attempts and criminal convictions are strong predictors. (10) A family history of another psychotic disorder did not have a significant effect on any of the observed variables with the exception of a slightly earlier age of onset of the disease.

### Limitations of the study

In a retrospective study, the large time gap between the onset of the disease and the time when patients were evaluated restricted the reliability of the results. Thus, our data is considered less reliable compared to first-episode studies. Due to difficulties in retrospective examinations, the lack of evaluation of the type of onset of the disease is also an important limitation of the study. Inferences made from the results of our study should be evaluated with the consideration of limitations of a cross-sectional study. Because a cross-sectional study does not indicate a causal relationship between variables, rather, it can reveal relations that are consistent with theoretical models. While the number of patients are high and are gathered from three different cities, its power of representation of all schizophrenia patients in Turkey is considered to be limited.

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