

Association of Wider Social Environment with Relapse in Schizophrenia: Registry Based Six-Year Follow-Up Study

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ABSTRACT

Introduction: The impact of social environment on the frequency and prevalence of schizophrenia is well known. However, in schizophrenia and other psychotic disorders, there are few studies which investigate the effect of social environment on disease prognosis and relapse. The aim of this study was to investigate the effect of neighborhood social capital level and address change on relapse in schizophrenia and similar psychotic disorders.

Methods: The research sample consisted of 147 patients (schizophrenia, 76.1%; n=112), who were being followed up at regular intervals of at most six months at the Psychotic Disorders Unit outpatient clinic. Patients were followed-up for relapse indicators between January 1, 2009 and December 31, 2013. During the follow-up, relapse criteria including hospitalization, increased need for help, self-harm, suicidal thoughts, violent behavior, suicide attempts, antipsychotic dose increase and electroconvulsive therapy were used. At least one of these criteria was accepted as a relapse for that period. Neighborhood social capital levels were obtained from a general public survey conducted in Izmir city center in 2008 and the voting rates in the neighborhood during the

follow-up period. In addition, during the follow-up period, any change in the address of the patient was recorded.

Results: While there was no correlation between the neighborhood social environment and relapse, a significant relationship was found between relapse and address changes. The probability of relapse was 1.3 times higher in patients with change of address (95% CI: 1.0-1.6; p<0.05), and decreased likelihood of relapse was found as the duration of residence in the same neighborhood shortened (β : (-0.05) 95% CI: [(-0.10)-(-0.003)]; p<0.05).

Conclusion: In schizophrenia, relapse appears to be related with the narrow social environment (family, home address) in which the person lives, not with the wider social environment (social capital of the neighborhood). The need for adaptation to a new social environment that arises with a change of address, albeit narrowly, can lead to an increase in symptoms of schizophrenia as a psychosocial stressor.

Keywords: Schizophrenia, psychotic disorders, social environment, social capital, relapse

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INTRODUCTION

Environmental risk factors (family environment, settlement, socio-cultural environment, etc.) and individual risk factors (genetic, familial inherited burden) are thought to be effective in the emergence of schizophrenia and other psychotic disorders (1, 2). For example, the annual incidence of schizophrenia is twice as high in urban areas as in rural areas (3). However, psychosis does not show a homogenous distribution in urban areas, and its distribution in the society differs according to urban settlement characteristics (1, 3, 4). It was also reported that this distribution difference in urban areas could be attributed to social environment characteristics by 23% (5). On the other hand, social environment-related features are not only associated with the emergence of psychotic disorders, but also with the appearance of subthreshold symptoms and psychotic experiences (6). The social environment in psychiatric research is discussed with a wide range of different definitions. In schizophrenia and psychosis phenotype studies, the urban social environment is sometimes evaluated indirectly by population density (7), ethnic density (8), ethnic belonging (9) and

social discrimination (10). Social environment in the psychosis researches has been defined through the concepts such as neighborhoods where individuals live and ethnic distribution, social disorder, and socioeconomic deprivation in these neighborhoods (1). These characteristics are addressed at the individual, neighborhood level, and show an inverse ratio risk relationship between the individual level and the neighborhood level. In other words, the risk of psychosis increases as people live in social circles where people do not have similar or less similar characteristics (4). On the other hand, the social environment of the person varies according to age and time (11). This social environment can be family, school environment, peer group, ethnic group, minority group or district (2). For this reason, the social environment in cities can be divided into narrow and wide according to the volume of hypothetical socialism it contains: the narrow social environment is composed of relatively identifiable elements such as family, while the wider social environment consists of variable elements such as neighborhood and its contents (12). Despite a significant number of studies, it can be said that the wide social

environment is a concept which is defined by its various dimensions, which are difficult to define and measure by drawing a scientific framework. One of the ways to evaluate the wider social environment is the concept of social capital (13). Examining the sociocultural structure of the neighborhoods in understanding the impact of urbanization has enabled the concept of social capital to come forward (14). Social capital can be seen as invisible links holding communities together and may vary according to neighborhood characteristics (13). For example, while the level of social capital may be lower in urban centers abandoned over the years, it may be higher in neighborhoods where families with immigrants from the same region live together (6). Social capital has administrative and managerial dimensions as well as cultural. In this context, the percentage of participation of a neighborhood in the country or city may point out to different dimensions of social interaction, solidarity and sharing or exclusion and social isolation (13). Few studies suggest a relationship between social capital and psychosis. Low or high social capital is associated with increased frequency of schizophrenia, whereas medium level social capital is associated with lower frequency rates (5, 15). In this sense, it has been suggested that there is a U-shaped relationship between psychosis and social capital (16). The characteristics associated with the social environment facilitate the emergence of psychotic disorders as risk factors and adversely affect the course of the disease in psychotic disorders and trigger relapses (17). The frequency of relapse appears to be related to disability and treatment resistance (17). In addition, it is an important treatment objective in schizophrenia to prevent relapse when a significant portion of the economic burden of schizophrenia is caused by relapses and hospitalization. Although there are many studies on the relationship between social environment characteristics, frequency and prevalence of psychotic disorders, there are a limited number of studies investigating the impact of social environment characteristics on disease course and relapses. In this study, we aimed to investigate the social capital of patients with schizophrenia as one of the risk factors of psychosis and to investigate the relationship between social environment variables and relapses of patients in the last five years.

METHOD

This study is a registry based follow-up study that examines the relationship between relapses and wider social environment characteristics in patients with schizophrenia and similar psychotic disorders. The sample is based on the registered patient follow-up of the Department of Psychotic Disorders at the Department of Psychiatry, Dokuz Eylül University. In this unit, patients diagnosed with schizophrenia or similar psychotic disorders (schizoaffective, delusional disorder, brief psychotic disorder and otherwise unidentified psychotic disorder) are followed according to international diagnosis systems. The applications for outpatient and inpatient treatment of the patients followed up in the unit were recorded by the written file system until 2009. As of January 1, 2009, a computer based registration system was introduced. The inclusion criteria included the following items: i) to be followed in the Psychotic Disorders Unit outpatient clinic between January 1, 2009 and December 31, 2013; ii) being started monitoring before 1 July 2011; (iii) to arrive at the outpatient controls within a minimum of six months period within the monitoring dates; iv) to be aged between 18 and 65 years (according to 1 July 2011); v) to be settled in İzmir city center (Balçova, Bayraklı, Bornova, Buca, Çiğli, Gaziemir, Güzelbahçe, Karabağlar, Karşıyaka, Konak, Narlıdere) for at least 2.5 years during the follow-up dates; vi) to be diagnosed with schizophrenia or schizoaffective disorder according to DSM-IV diagnostic system. In a case of additional illness (such as intellectual disability, autism, physical disability) that could affect the patient's social mobility, the person was not included in the study. The participants were informed about the study and written informed consent was obtained from the participants. The study was approved

by the Dokuz Eylül University Ethics Committee for Non-Interventional Research and was conducted in accordance with the Declaration of Helsinki.

Collection of Research Data

Research data were obtained from the follow-up records of the Psychotic Disorders Unit. Sociodemographic information (age, gender, marital status, educational status, working status, place of residence), DSM-IV diagnosis based on SCID-I interview, status of symptoms in the control period (positive, negative, disorganization), ongoing pharmacological and non-pharmacological treatment within the control period, hospitalization status in the control period, suicidal thoughts or attempts, damage to the self or relatives in that period. The information was coded as separate substances in each control interview. The missing data within the study period were completed retrospectively in face-to-face interviews with the patient and / or patient relatives. Patient interviews and recording were performed between September 2014 - March 2015. In addition, the name of the neighborhood where the patient was living during the follow-up period, the duration of residence in each neighborhood and whether there was a change of address were recorded.

Obtaining Relapse Related Data

The relapse criteria of the study was based on the criteria defined by Csernansky et al. (18) and consisted of eight items. The first five items (hospitalization, increased need for help, self-harm, suicidal thoughts, violent behavior) were taken from these criteria (18). The last three items are the criteria that are routinely included in the patients' follow-up records (Table 1). Each criterion is assessed for a 6-month period. If there is at least one of the 8 criteria in the 6-month period, it is considered to be a relapse (18).

The Relapse Criteria Used in the Study*
1. Admission to psychiatry clinic
2. Increase in the need for psychiatric assistance (increase in admission to the clinic, hospitalization as a day patient etc.)
3. Self-harm behavior
4. Suicidal or homosidal thought thought to be significant in interviewer evaluation
5. Violent behavior towards the person or object
6. Suicide attempt
7. Increase in the dose of antipsychotic drug used
8. Having received electroconvulsive therapy
* Adapted from (18).

Evaluation of Wide Social Environment

In the study, wide social environment features were evaluated on the basis of the neighborhood where the patient lived. The neighborhood where each patient lived during the follow-up period was obtained from the interviews. In the follow-up period, the neighborhood where the patient lived for the longest time was accepted as the neighborhood / index and the wide social environment data were obtained based on this neighborhood. The wide social environment characteristics are defined by three main components: i) neighborhood social capital level, ii) the level of neighborhood socioeconomic deprivation (unemployment rate in the neighborhood and the proportion of low-income households in the neighborhood), iii) the level of participation to elections in the neighborhood. Data on neighborhood social capital and socioeconomic deprivation level were taken from TürkSch: Mental Health Survey for Gene-Environmental Interaction in Psychotic Disorders of İzmir (6). Within the scope of this project, social capital levels and socioeconomic deprivation indicators of 302 neighborhoods in İzmir city center (Balçova,

Bornova, Buca, Çiğli, Gaziemir, Guzelbahce, Karsiyaka, Konak, Narlidere) were found in interviews with 5134 people (6). The data on the social capital level and socioeconomic poverty level of the neighborhood were obtained by collectively evaluating the individual level responses to the surveys and generalizing them to the neighborhood level (6).

Neighborhood Social Capital Data

In the TurkSch study, 21 questions were used for social capital assessment and the questions were taken from the research of Putnam et al. (19). These social capital scales were used in psychosis research in England and the Netherlands (15, 16). The social control (SC 01-05), social cohesion and trust (SCT 06-13) and social dysorganization (SD 14-21) levels of each neighborhood were obtained in Izmir. SC, SCT and SD levels for each neighborhood were divided into three groups as low / medium / high compared to the average (6).

Neighborhood socioeconomic deprivation data

Within the scope of TurkSch research, average unemployment and low-income households (monthly net household income below 1000 TL) were determined for each neighborhood. The ratio of unemployment and low-income households for each neighborhood is divided into three groups as low / medium / high (6).

Levels of participation in neighborhood elections

The sense of trust and citizenship participation of individuals living in a neighborhood against public institutions is accepted as a social capital dimension (13, 20). In administrative elections, the social capital level is obtained by dividing the number of voters in a neighborhood / region by the number of voters (participation rate in elections) (20). Within the follow-up period of the study (1 January 2009 - 31 December 2013), 29 March 2009 Local Administrations Election, 2010 Public Voting and General Elections of the Parliament (2011) took place. The rates of participation in elections for each neighborhood in the city center of Izmir were obtained from the online page of the High Election Board (www.ysk.gov.tr). The participation rates of the neighborhoods were divided into three groups as low / medium / high compared to the average in each selection.

Statistics

SPSS 18.0 software was used for all test statistics. Chi-square test was used for categorical variables, and t-test was used for pairwise comparison of continuous variables. Sociodemographic characteristics, wide social environment characteristics (social capital and socioeconomic deprivation levels), settlement history (change of address and residence time in the neighborhood) were defined as independent variables. The relapse history of the research sample during the five-year follow-up period (yes / no) was defined as dependent variable. Logarithmic binomial regression and Poisson regression methods were used to determine the factors predicting recurrence during the five-year follow-up period. Relative risk was calculated in categorical variables and logarithmic coefficient (β) was calculated in continuous variables. Each risk relation was first calculated in pairs (relapse yes / no and related variable) and then by age, gender and educational status. P value <0.05 was considered for the results. The relationships obtained by regression were evaluated with relative risk and 95% confidence intervals.

RESULTS

The study sample consisted of a total of 147 patients, 112 patients with schizophrenia (76.1%), 20 patients with schizoaffective disorder (13.6%), and 15 patients with other psychotic disorders (10.2%). During the 5-year follow-up period, the percentage of having at least one relapse period was 61.2% (n: 90). Table 1 shows the comparison of the sociodemographic

and clinical features of the sample according to the relapse status. The group who experienced relapse at least once in the follow-up period had higher rates of being single or divorced (76.7% and 45.6%) and living with family (72.2% and 47.4%). Cannabis use and disease onset were 3 years earlier (23.9 and 26.9 years) compared to the group who did not have relapses.

Table 2 shows the comparison of the sample with respect to the relapse status in terms of wide social environment characteristics. In the group who had a relapse at least once, the ones who changed their addresses at least once within the follow-up period were higher (23.3% and 10.5%) compared to the non-relapse group, and the mean residence time in the indicator neighborhood was lower (53.3 and 58.2 weeks). There were no differences between the groups with and without relapses in terms of social capital indicators of the districts where they lived the longest in Izmir during the follow-up period. The ratio of low-income households was higher in the neighborhoods where relapse occurred when compared to the non-relapse group (49.9% and 44.6%).

The relevance of relapse with residence time and change of address was examined, controlling for age, gender and educational status. Relapse probability was 1.3 times higher (95% CI:1,0-1,7; $p<0,05$) and as the duration of residence in the same neighborhood was longer, the likelihood of relapse decreased. (β :(-0,05); 95 % CI: [(-0,10)-(-0,01)]; $p<0,05$) (Table 3).

DISCUSSION

In this study, we aimed to investigate the effect of social environment characteristics such as social capital and settlement change on relapses in schizophrenia and similar disorders. According to our findings, no significant relationship was found between the social capital levels of the neighborhood which could be considered as wide social environment characteristic in schizophrenia and similar psychotic disorders. On the other hand, it was determined that change in address which can be considered as narrow social environment feature increases the probability of relapse. In accordance with this finding, the likelihood of relapse increased as the residence time shortened at the same address. The complex relationship between schizophrenia and the social environment has been explored for nearly a century. A more frequent finding of the frequency and prevalence of psychotic disorders in high-socioeconomic deprivation sites is a frequent finding (21). The relationship between the society and social environment and the psychotic symptoms and disorders of individuals is frequently shown (1). Relapse in schizophrenia is generally thought to be associated with clinical variables, but it can be predicted that the social environment in which the patient lives will have an impact (22). On the other hand, there is data from the World Health Organization that schizophrenia has a better course in underdeveloped countries and in rural areas (23). It has been suggested that the relative well-being of schizophrenia in these regions may be related to a protective social environment (family, solidarity, etc.) (23).

Although this finding can be indirectly interpreted, wide social environment characteristics can be interpreted to be effective on the course and relapse of schizophrenia (24). However, the number of studies evaluating iterations is low in the large social environment or family environment. In a recent study, the prevalence of treatment-resistant schizophrenia has been reported to be higher in less urbanized areas (25).

It has been reported that the frequency of psychotic disorders increases as the socio-economic deprivation of the neighborhood increases in Sweden (20). In another study investigating the impact of social environment characteristics (socioeconomic deprivation / social capital) on the frequency of schizophrenia and other non-affective psychosis

Table 1. Sociodemographic and clinical features of the sample according to relapse status during 5 years follow-up

	Without relapse (n: 57)		With relapse (n: 90)		Statistics	p	Total	
	Number	(%)	Number	(%)			Number	(%)
Gender								
Female	27	47.4	31	34.4	Pearson χ^2 : 2.44	.12	58	39.5
Male	30	52.6	59	65.6			89	60.5
Marital Status								
Single/divorced	31	54.4	69	76.7	Pearson χ^2 : 7.96	<.05	100	68.0
Married/widowed	26	45.6	21	23.3			47	32.0
Education Status								
≤8 years	20	35.1	31	34.4	Pearson χ^2 : 0.01	.94	51	34.7
>8years	37	64.9	2159	65.6			96	65.37
Employment Status*								
Working	15	26.3	20	22.2	Pearson χ^2 : 0.32	.57	35	23.8
Unemployed	42	73.7	70	78.8			112	76.2
Socioeconomic Status**								
High	6	10.53	11	12.22	Pearson χ^2 : 0.91	.71	17	11.5
Middle	18	31.58	26	28.89			44	30.0
Low	33	57.89	53	58.89			86	58.5
Monthly Household Income								
<4000 TL	47	82.5	71	78.9	Pearson χ^2 : 0.28	.59	118	80.3
≥4000 TL	10	17.5	19	21.1			29	19.7
Way of living								
With parents	27	47.4	65	72.2	Pearson χ^2 : 14.8	.02	92	62.6
With spouse	23	40.4	12	13.3			35	23.8
Alone/other	7	12.2	13	14.5			20	13.6
Alcohol Use								
Have not used	24	42.1	27	30.0	Pearson χ^2 : 2.25	0.13	51	34.7
Have used	33	57.9	63	70.0			96	65.3
Cannabis Use								
Have not used	55	96.5	76	84.4	Pearson χ^2 : 5.22	<.05	131	89.1
Have used	2	3.5	14	15.6			16	10.9
Psychiatric Disease in Family								
No	19	33.3	34	37.8	Pearson χ^2 : 0.84	0.65	53	36.1
Yes, other	23	40.3	38	42.2			61	41.5
Yes, psychosis	15	26.3	18	20.0			33	22.4
	Mean (SD)	95% CI	Mean (SD)	95% CI	Statistics	p	Mean (SD)	95% CI
Disease Characteristics								
Age	47.6 (9.6)	(45.0-50.1)	41.8 (10.4)	(39.6-43.9)	$t_{145}=3.4$	<.05	44.04 (10.4)	(42.3-45.7)
Age at first attack	26.9 (10.5)	(23.9-29.9)	23.9 (7.5)	(22.3- 25.5)	$t_{139}=2.0$	<.05	25.0 (8.9)	(23.6-26.5)
Duration of illness	20.1 (10.7)	(17.1-23.1)	17.7 (8.8)	(15.8-19.6)	$t_{139}=1.4$.07	18.6 (9.6)	(17.0-20.2)

*Employment status: Those currently working / have worked and those who have retired under normal conditions are considered to be employed.

**Socioeconomic status was determined by the occupation class of the head of the household: Upper: 1. Factory-business owner 3. Doctor-engineer-lawyer-officer; Intermediate: 4-Teacher-nurse-officer-non-commissioned officer, Low: 7. The skilled worker, 8. Unqualified worker

Table 2. Wide social environment characteristics of the sample over the 5-year follow-up in terms of relapses

	Without relapse (n: 57)		With relapse (n: 90)		Statistics	p	Total	
	Number	(%)	Number	(%)			Number	(%)
Address change								
No	51	89.5	69	76.7	Pearson χ^2 : 3.82	<.05	120	81.6
*Yes, at least one	6	10.5	21	23.3			27	18.4
Duration of residence^a								
	Mean (SD)	95% CI	Mean (SD)	95% CI			Mean (SD)	95% CI
	58.2 (5.7)	(56.7-59.7)	54.3 (11.0)	(52.0-56.6)	$t_{145}=2.48$	<.05	55.8 (9.5)	(54.2-57.3)
	Number	(%)	Number	(%)	Statistics	p	Number (%)	Number
2009 local elections^b								
Same	34	(59.6)	51	(56.7)	Pearson χ^2 : 0.33	.84	85	(57.8)
Low	14	(24.5)	26	(28.9)			49	(27.2)
High	9	(15.7)	13	(14.4)			22	(15.0)
2010 referendum^b								
Same	31	(54.4)	42	(46.7)	Pearson χ^2 : 1.15	.56	73	(49.7)
Low	8	(14.0)	18	(20.0)			26	(17.7)
High	18	(31.6)	30	(33.3)			48	(32.6)
2011 general elections^b								
Same	32	(56.1)	57	(63.3)	Pearson χ^2 : 0.77	.68	89	(60.5)
Low	14	(24.5)	19	(21.1)			33	(22.5)
High	11	(19.3)	14	(15.6)			25	(17.0)
Everyday Social Control								
Low	29	(50.8)	39	(46.3)	Pearson χ^2 : 0.81	.65	68	(46.3)
Medium	20	(35.1)	35	(37.4)			55	(37.4)
High	8	(14.1)	16	(16.3)			24	(16.3)
Social Cohesion and Trust								
Low	34	(59.6)	46	(51.1)	Pearson χ^2 : 1.5	.42	80	(54.4)
Medium	12	(21.1)	27	(30.0)			39	(26.5)
High	11	(19.3)	17	(18.9)			28	(19.1)
Social Disorganization								
Low	19	(33.3)	30	(33.3)	Pearson χ^2 : 0.61	.72	49	(33.3)
Medium	24	(42.1)	33	(36.7)			57	(38.8)
High	14	(24.6)	27	(30.0)			41	(27.9)
Neighborhood unemployment rate								
Low	19	(33.3)	35	(38.9)	Pearson χ^2 : 0.46	.75	54	(36.7)
Medium	32	(56.2)	46	(51.1)			78	(53.1)
High	6	(10.5)	9	(10.0)			15	(10.2)
Neighborhood low-income rate								
Low	36	(63.2)	51	(56.7)	Pearson χ^2 : 0.92	.63	87	(59.2)
Medium	15	(26.3)	25	(27.8)			40	(27.2)
High	6	(10.5)	14	(15.5)			20	(13.6)
	Mean SD	95% CI	Mean SD	95% CI	Statistics	p	Mean SD	95% CI
Neighborhood unemployment rate	6.6 (4.4)	(5.4-7.5)	6.2 (5.6)	(5.1-7.5)	$t_{145}=0.4$.69	6.4 (5.2)	(5.5-7.2)
Neighborhood low-income rate	44.6 (16.9)	(40.1-49.1)	49.9 (18.9)	(45.9-53.9)	$t_{145}=-1.7$	<.05	47.9 (18.4)	(44.9-50.8)

*3 people have been replaced more than once in the last five years; ^alongest residence time in the neighborhood where data for analysis is accepted; ^bpercentage of participation in elections in the neighborhood where data for analysis is accepted according to the average of Izmir

Table 3. The relationship between relapse and wide social environment characteristics

	RR*	95% CI	P	RR ^a	95% CI	P
Address change						
No	Ref	-		ref	-	
Yes	1.4	(1.0-1.7)	0.05	1.3	(1.0-1.6)	<.05
2009 local elections						
Same	ref	-		ref	-	
Low	1.1	(0.8-1.4)	.59	1.1	(0.8-1.4)	.64
High	0.9	(0.7-1.4)	.94	0.9	(0.6-1.4)	.83
2010 referendum						
Same	ref	-		ref	-	
Low	1.2	(0.9-1.7)	.26	1.1	(0.8-1.5)	.52
High	1.1	(0.8-1.4)	.58	1.1	(0.8-1.5)	.39
2011 general elections						
Same	ref	-		ref	-	
Low	0.9	(0.6-1.2)	.53	0.8	(0.6-1.1)	.29
High	0.9	(0.6-1.3)	.49	0.8	(0.2-1.2)	.36
Everyday Social Control						
Low	ref	-		ref	-	
Medium	1.1	(0.8-1.5)	.47	1.0	(0.8-1.4)	.82
High	1.2	(0.8-1.6)	.39	1.1	(0.8-1.6)	.50
Social Cohesion and Trust						
Low	ref	-		ref	-	
Medium	1.2	(0.9-1.6)	.19	1.2	(0.9-1.5)	.25
High	1.0	(0.7-1.5)	.76	1.0	(0.7-1.5)	.80
Social Disorganization						
Low	ref	-		ref	-	
Medium	0.9	(0.6-1.3)	.72	1.0	(0.7-1.4)	.94
High	1.1	(0.6-1.5)	.65	1.1	(0.8-1.4)	.66
Neighborhood unemployment rate						
Low	ref	-		ref	-	
Medium	0.9	(0.7-1.2)	.49	0.9	(0.7-1.2)	.37
High	0.9	(0.6-1.4)	.74	0.8	(0.5-1.3)	.41
Neighborhood low-income rate						
Low	ref	-		ref	-	
Medium	1.1	(0.8-1.4)	.67	1.0	(0.7-1.4)	.85
High	1.2	(0.8-1.7)	.30	1.1	(0.8-1.5)	.55
	β	95% CI	P	β^a	95% CI	P
Neighborhood residence time^b	-0.05	[(-0.10)-(-0.01)]	<.05	-0.05	[(-0.10)-(-0.003)]	<.05

*Relative risk. Relapse in those who did not relapse ^aRatio of adjusted probabilities for age, gender, and educational status; ^aThe ratio of corrected probabilities for age, gender and educational status; ^bLongest residence time in the neighborhood where data is accepted for analysis

independent of individual characteristics, 23% of the variation in the frequency of schizophrenia has been attributed to the characteristics of the social environment (5).

In a study conducted in Maastricht, the Netherlands, hospitalizations were examined as a variable that might be a sign of relapse (15). It has been reported that admission and hospitalization for schizophrenia increase as neighborhood social capital level decreases (15). In our study, hospitalization was only one of the relapse criteria, and in view of hospitalizations as well as other relapse criteria, it can be thought that there is a more comprehensive screening in terms of navigation and relapse than previous studies. Social capital is considered as a buffer function that regulates social stress caused by a person's social environment: in individuals with low social capital, dopamine sensitization and genetic predisposition may lead to psychotic experiences, symptoms, and disorder in the context of insecurity in the social environment. On the contrary, even if individuals who grow up in environments with high social capital have a genetic predisposition, they can suppress such references at a cognitive level due to the social, solid and protective characteristics of that region and their experience may not reach the level of psychotic disorder (1). However, all these relationships vary according to the environment.

Likewise, different aspects of the wider social environment in Turkey (settlement levels of social capital and socioeconomic deprivation level) with an inverse relationship between psychosis continuum has been reported: high levels of social capital with areas was found to be more common in more severe manifestations of psychosis continuum (6).

Participation in elections (voting) defines individuals as a component of social capital in relation to their trust in public institutions and their identity to citizenship (13). This concept, which emphasizes the democratic participation of communities, is measurable, easy to access and reliable, but it can be an indirect and limited indicator of social capital. It is stated that there are many factors that affect participation in elections, at the individual level (eg education, socioeconomic status), at the regional level (eg ethnic origin) and many other political and cultural factors that cannot only be restricted to regional levels (20). In our study, we compared the previous studies (15, 16) with wider and different dimensions of social capital (everyday social control, social intricacies and trust, in-neighborhood irregularity). However, the lack of a direct relationship between social capital and relapses may be related to the fact that social capital is complex and difficult data to be affected by socio-political, sociocultural and sociodemographic characteristics in neighborhoods (13).

In addition, the relatively small size of our research sample compared to previous researches on social capital may have led to a insignificant relationship between this social capital and relapses. It is known that there is a relationship between change of address or residence change and psychotic disorders (26). The risk of psychotic disorder in adulthood is lower in children and adolescents with less changing neighborhood and environment (26). It is thought that this risk relation may be related to the change of peer environment and social networks.

On the other hand, the change in residence was associated with an increase in hospitalization and length of hospital stay (27-30). In our study, because hospitalization is one of the relapse criteria, it can be said that there is a significant relationship between residence change and hospitalization in accordance with previous studies. To the best of our knowledge, there is no other research that examines the relationship between residence replacement and relapses. Change of address often involves disruption or interruption of access to health care; work, education and social support networks and therefore may trigger

relapses. Since the change of address causes the social environment of the patients to change, it may be perceived as a stressful and negative life experience by the patients. This situation seems to be related to the break of the connection with the neighbor and friends, the decrease of social support of the patients and the increase of social isolation. On the other hand, the relationship between the change of address and the relapse of schizophrenia may be reversed. The increase in psychotic symptoms may necessitate change of address due to deterioration in social relations.

The findings of the study should be evaluated together with some limitations. First of all, the number of participants is relatively low and based on the follow-up records of a specialized unit in the field of psychotic disorders, this may have led to bias in the findings. Second, the social environment (neighborhood social capital level or residence replacement requirements) characteristics may differ in the patient group with longer intervals or irregular follow-up in the same unit and this group of patients may have different social environment characteristics. Third, although the patients were followed up at six-month intervals, retrospective information bias may have occurred during the six-year follow-up. However, with basic data such as an address, this bias can be said to be quite low. On the other hand, it can be thought that the sample has come to the outpatient clinic at a maximum of six months intervals and because it is based on a total of patients who have been recorded during the follow-up period, it provides a relatively strong examination of the causality relationship between factor and outcome. In addition, both wide and narrow social environment data have objective features. In later studies, social problems (exclusion, forensic problems, interruptions in family relations) caused by an increase in psychotic symptoms should be examined for the relationship between change of address and schizophrenia relapses.

CONCLUSION

There is a strong relationship between the different characteristics of the social environment in which individuals live and the emergence of psychotic disorders. A similar relationship may also be valid in the exacerbation and sedation of symptoms after the occurrence of a psychotic disorder. According to the findings of this study, there may be a relationship between displacement of urban area and schizophrenia relapse not with the wide social environment itself. Certain features such as social capital level of neighborhoods and poverty levels, may affect the emergence or exacerbation of delusions and hallucinations at different levels. The contradictory results of social environment and social capital may also be due to differences in urbanization characteristics (population mobility, population density, etc.) and socio-cultural characteristics (ethnic groups, immigrant groups, religious minorities, etc.) between countries / cities. In research neighborhoods are mostly preferred as social environment. However, when the diagnosis of psychosis is considered for patients; it can be thought that the environment where the patients are mostly perceived, exposed and interacting may be a narrower social environment than the neighborhoods. Further research is needed to clarify the effect of social environment and social capital on the incidence and course of psychotic disorders, which is still a clear concept and difficult to quantify. In the future studies, it would be appropriate to study social relations, solidarity, and cooperation as well as exclusion and discrimination in daily life with a larger sample group. Instead of recording data based on records, placement of scales evaluating the stress they experience in the wide (residential) and narrow (family) social environment to the routine follow-up of schizophrenia patients may strengthen the results of the research.

On the other hand, in order to prevent relapse in schizophrenia, stress-reducing arrangements (eg: including planning of the transport process and involvement of the patient in the process) will be useful.

Ethics Committee Approval: Ethical approval was obtained from the Ethics Committee of Dokuz Eylül University Non-Interventional Research.

Informed Consent: Written consents were obtained from the participants.

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