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ORIGINAL PAPER

Prevalence and risk factors of psychotic symptoms: in the city of Izmir, Turkey

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Abstract
Background Psychotic symptoms, psychotic-like experiences and schizotypal signs can emerge in different socio-cultural circumstances and cause clinical or non-clinical pictures. Transient or self-limiting psychotic-like experiences are more prevalent than clinical psychotic disorders. The aim of this study is to determine the prevalence and sociodemographic correlates of psychotic symptoms in an urban area.
Methods A cross-sectional study was conducted among the residents of two districts in the urban area of Izmir, Turkey. Among the systematically selected 1,500 residents of 85,212-study population, a total of 1,268 individuals (response rate: 84.5%) were screened for any lifetime psychotic symptoms.
Results Composite International Diagnostic Interview (CIDI) was used to assess psychotic symptoms. CIDI (+) psychotic symptoms were found in 3.6% of the screened sample. Logistic regression analysis showed that being a female (OR = 2.4, 95% CI = 1.2–5.1), having a first degree family history of any mental disorders (OR = 13.9, 95% CI = 5.7–34.3), lack of social support (OR = 4.5, 95% CI = 2.3–8.6) and alcohol use (OR = 4.9, 95% CI = 2.3–10.6) were all related to psychotic symptoms.
Conclusion Prevalence of any psychotic symptom is lower compared to European studies. Alcohol might be considered as a risk factor for developing psychotic symptoms in the Turkish cultural setting.

Keywords Psychotic symptoms · Prevalence · Epidemiology · Risk factors · Turkey

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Introduction

In clinical practice, mental health professionals identify individuals with psychosis by the presence of characteristic criteria, which are assumed to represent the core features of the disorder. However, clinical procedure does not identify a valid categorical phenotype. Psychotic symptoms, psychotic-like experiences and schizotypal signs can emerge in different socio-cultural circumstances and cause clinical or non-clinical pictures [20, 25, 31, 44]. Although brief, transient or self-limiting psychotic-like experiences are more prevalent than DSM or ICD psychotic disorders, only a small percent of the people develop clinical disorders [28, 37]. It has been concluded that as the level of any psychotic experiences increases, the probability of having a psychotic disorder increases in a dose–response fashion [38]. They form a large pool of pre-clinical psychotic experiences, of which only a small proportion may continue to result in overt disorder [39]. Hence, it is of importance to assess the frequency of these symptoms and the related risk factors in the population in order to diagnose and treat at the early stages of disorders.

There are some possible risk factors related with psychosis-like experiences and psychotic disorders. Urban environment is the most important proxy environmental risk factor [23]. There is evidence that it interacts with genetic risk [40] and it has been hypothesized that the mechanism involves the cumulative effects of altered

social interactions at the individual level and possibly also at the level of the wider social environment, such as the neighborhood [4]. Early trauma is another aspect of the environment that has recently been linked prospectively to psychosis [29], and meta-analytic work demonstrates conclusively that minority status is a risk factor [7], part of which may be mediated by chronic exposure to discrimination [12].

Most of the literature about the psychosis epidemiology originate from the studies conducted in western societies. The current study investigates cross-sectionally the degree of the presence of self-reported psychotic experiences in the general population in an urban area in the city of Izmir, Turkey. This is the first study from Turkey, a country that has both western and eastern type of culture, focusing on the community level of psychotic symptoms. It also provides some internationally comparable data that indicate whether risk factors for psychotic symptoms which are relevant in developed countries are similar ones in Turkey as a model for developing countries.

Aims of the study

First, to investigate the lifetime prevalence of any psychotic symptom in a Turkish urban community. Secondly, to find risk factors for developing psychosis and examine the social correlates of experiencing any psychotic symptoms.

Methods

Setting

Izmir is the third largest and highly industrialized city of Turkey, with a population of 2.4 million in the city center at the time of 2000 census [36]. The city lies in the western shore of Turkey, the most crowded city in the Aegean region of the country. Among the nine central districts, Balcova and Narlidere districts cover a complete urban population of 121,084 people at the time of 2000 census. Population density for the entire country was 88 km^{-2} and it was 281 km^{-2} for all Izmir provinces. The population density in Balcova district was 3,152 km^{-2} (third in all districts of Izmir) and 859 km^{-2} for Narlidere. Annual growth rate of population in urban Izmir was 24.55‰ and in rural areas of Izmir was 13.60‰. Annual growth rate of population in Balcova was 11.14‰ and in Narlidere 44.00‰. In the last 10 years, these two districts had immigrants from the eastern part of the country. The households within the districts have a wide ranging spectrum of socioeconomic status.

Design

The study population consisted of 85,212 people aged ≥18 who lived in Narlidere and Balcova health districts in Izmir, Turkey. The sample size required for this study was calculated as 1,473 (rounded to 1,500) people, assuming 1% prevalence of schizophrenia and 0.5% error and with 95% confidence level. Households were considered as sampling units. The average number of people over 18 years of age for each household was calculated as 2.5 from the two health districts' registers. The sample size was estimated as 600 households, which was boosted by 10%, so that 660 households were targeted for the survey. Household lists were obtained from the Narlidere and Balcova health districts and houses were selected systematically from these lists. The initial house was selected by generating a random number and then every 28th (sampling interval) household was included in the sample. In another article, we compared the age, sex and educational structure of the sample with Turkish urban population figures obtained from the Statistics Institute of Turkey [13]. The sex and educational level of the sample were similar with the general urban population of Turkey.

Data collection

Composite International Diagnostic Interview (CIDI) has been developed by the World Health Organization (WHO) in order to assess the mental health status of different populations [30]. CIDI has been used in several studies across the world [46], including Turkey [21]. It is a structured interview and it can be used by the trained lay interviewers as a screening tool in order to detect any experience of psychotic-like experiences and psychotic symptoms [11].

Instead of using the whole CIDI, since the primary aim of the study was to screen the sample for any psychotic symptoms, we preferred to use the screening questions of the psychosis module (module G) of CIDI. The CIDI version 2.1 has been previously translated into Turkish for other field studies [17].

Lay interviewers were ten university students of the Health Institute of Dokuz Eylul University. They have been trained for CIDI evaluation for a week by the CIDI training certified study participants in the Department of Psychiatry.

Data collection period was between March and June of 2003. The target 660 households were visited by lay interviewers in order to detect the individuals older than 18 years of age and inform about the participation in the study. From the health district registers, it has been detected that about 1,551 individuals over 18 years old were eligible for the interview as a resident in the targeted households. When the eligible person in the household was absent at the time of visit, two more consecutive visits were scheduled.

In order to obtain the data, CIDI version 2.1 and sociodemographic information questionnaires (including information on age, gender, marital status, education, perceived social support, medical history [including diabetes, hypertension, myocardial infarction, asthma, tuberculosis, cancer, stroke, epilepsy, arthritis], use of medication, tobacco, alcohol, and drug use) were completed among the eligible individuals using a face-to-face interview technique after asking verbal consent from the participants. The study was approved by Clinical Research Ethics Committee of Dokuz Eylul University School of Medicine.

Data processing

Out of 660 households and 1,551 register-based detected individuals, 575 households and 1,280 individuals completed the study, yielding response rates of 87% for houses and 82.5% for eligible people, i.e. ≥18 years old. Of the 660 households selected, 85 were not eligible for the study because they were either empty or the residents refused to participate. More than one person has been interviewed in a single household. Twelve people refused to respond to the CIDI part of the study. The whole completed data of 1,268 individuals have formed the basis of our analysis.

CIDI 2.1 G section (psychosis section) has 15 questions for delusions (items G1–G15) and 6 questions for hallucinations (items G17–G22). Nine of the 15 delusion evaluation questions and three of the six hallucination evaluation questions have two levels: a screen and a probe. Screen questions are coded as 1 (no) and 5 (yes). If respondent replies to screen question as 5, then interviewer asks the probe question (evaluation of plausibility for psychotic symptom) which will be coded as 1 (no) and 5* (yes). CIDI 2.1 algorithm canalizes all 1 coded screen questions to the next screen question. Probe items have to be counted as endorsement. Other questions are coded as 1 (no) and 5* (yes) and they do not have screen–probe dichotomy. Our results are based on the analysis of any 5* coded answer.

Statistical analysis was done using the SPSS 11.0. Chi-square and *t* tests were used for difference between symptomatic and non-symptomatic groups. Risk factors for psychotic symptoms were analyzed using logistic regression. Gender, education, marital status, social and economic support status, family history and substance use were the covariates taken into the model by backward elimination method.

Results

The mean age of the study population was 42.9 ± 14.7 and 47.6% were men. Nine percent of the study group was over 65 years. There were no significant differences in age groups by gender. Most of the participants rated their economical position as "fair" (81.2%). Seven percent of the total study sample had no formal education (Table 1). Unemployed participants consisted of 4.1% of the study population.

CIDI psychotic symptoms were found in 3.6% of the study group. Mean age of 46 CIDI (+) cases (29 females, 17 males) was 39.48 ± 14.04. Although mean age was younger for CIDI (+) people, the difference between CIDI (+) and CIDI (−) groups was not statistically significant.

Nineteen individuals had only one symptom (1.5%), whereas in 15 individuals there were two symptoms (1.2%) and in 12, three or more symptoms (1.0%) were detected. Most frequent symptoms were thought broadcast (1.4%), delusions of persecution (1%), catatonia (1%), visual hallucinations (0.7%) and olfactory hallucinations (0.7%).

Table 1 Demographic characteristics of respondents

	CIDI (+) ($N = 46$)	CIDI (−) ($N = 1{,}222$)	Total ($N = 1{,}268$)
Age	39.48 ± 14.04	43.09 ± 14.72	42.89 ± 14.73
Gender			
Male	17 (37%)	588 (48%)	605 (48%)
Female	29 (63%)*	634 (52%)	663 (52%)
Marital status			
Married	33 (72%)	902 (74%)	935 (74%)
Single, divorced or widowed	13 (28%)	320 (26%)	333 (26%)
Education			
Primary	24 (52%)	613 (51%)	637 (51%)
High school or university	22 (48%)	609 (49%)	631 (49%)
Working status			
Employed	12 (26%)	470 (38%)	482 (38%)
Unemployed	34 (74%)	752 (62%)	786 (62%)
Prevalence of any mental disorders in 1° relatives			
Positive	9 (20%)**	20 (2%)	29 (2%)
Negative	37 (80%)	1,202 (98%)	1,239 (98%)
Social support			
Yes	29 (63%)	1,068 (87%)	1,097 (86%)
No	17 (37%)**	154 (13%)	171 (14%)
Financial support			
Yes	25 (54%)	1,053 (86%)	1,078 (85%)
No	21 (46%)**	169 (14%)	190 (15%)
Tobacco usage			
Positive	22 (48%)	471 (39%)	493 (39%)
Negative	24 (52%)	751 (61%)	775 (61%)
Alcohol use			
Positive	15 (33%)**	162 (13%)	177 (14%)
Negative	31 (67%)	1,062 (87%)	1,091 (86%)

*$P < 0.05$, **$P < 0.001$

CIDI (+) group had significantly less social and financial support, more alcohol use compared to CIDI (−) group. Only three individuals had substance abuse (cannabis) and none of these were CIDI (+) for psychotic symptoms. Age, working status, tobacco use, education, medical history were all not associated with psychotic symptoms. In this study, only one individual reported family history of schizophrenia. However, 1.3% of the sample had a family history of depressive disorder.

Logistic regression analysis showed that being a female (OR = 2.4, 95% CI = 1.2–5.1), having a first degree family history of any mental disorders (OR = 13.9, 95% CI = 5.7–34.3), lack of social support (OR = 4.5, 95% CI = 2.3–8.6) and alcohol use (OR = 4.9, 95% CI = 2.3–10.6) were all related to psychotic symptoms (Table 2).

Discussion

The prevalence rate for psychotic symptoms was lower in this study compared to previous population-based epidemiologic studies. We found that prevalence for any lifetime psychotic symptoms was 3.6% in the urban population in Izmir, Turkey. In baseline data of a longitudinal study held in the Netherlands, although the prevalence of any psychotic or psychosis-like symptoms was 17.5%, any rating of hallucinations and/or delusions was 4.2 and 1.5% of the study population received a DSM-III-R diagnosis of affective or non-affective psychotic disorder [17, 38]. In National Comorbidity Study of USA, the prevalence of any type of psychotic experience was 28.4% and the prevalence of broadly defined psychosis was only 0.7% [20]. The prevalence of "true" psychiatrist rated delusion was 3.3%, whereas "true" psychiatrist rated hallucination was 1.7% in a sample of 7,076 people in one of the studies of Van Os and colleagues [38]. In a recent study from Finland, the lifetime prevalence of all psychotic disorders was 3.06% and rose to 3.48% when register diagnoses of the nonresponder group were included [27]. Lifetime prevalence was as follows: 0.87% for schizophrenia, 0.32% for schizoaffective disorder, 0.07% for schizophreniform disorder, 0.18% for delusional disorder, 0.24% for bipolar I disorder, 0.35% for major depressive disorder with psychotic features, 0.42% for substance-induced psychotic disorders, and 0.21% for psychotic disorders due to a general medical condition [27]. Low prevalence may also be the result of relatively old age of the sample [41].

We did not find relationship between younger age and psychotic symptoms. This finding was not consistent with most of the literature [33, 34, 41]. This might also arise our relatively old age sample.

In our sample, females had two and half times more risk for developing CIDI psychotic symptoms. This finding was not consistent with most of the literature. It was suggested that male gender was associated with having schizophrenia in previous studies [19, 24, 41]. Also meta-analytic studies have found that male/female ratio for having schizophrenia was about 1.40 [1, 26, 32]. Female patients are much likely to display positive symptoms of psychosis whereas men present more negative symptoms [8, 14, 16, 38]. In one of our previous studies, we have found that female schizophrenia patients in Turkey were more disabled at the end of 1-year follow-up period [5]. Scott et al. [34] suggested that females were significantly more likely to endorse CIDI hallucination items; however, there was no effect of gender on endorsement of CIDI items related to delusions. Also Turkish females living in the Netherlands reported the highest rate of lifetime hallucinations among all ethnic groups [42].

Cannabis use has been reported as an important risk factor for developing schizophrenia [18]. Also early cannabis use is more related to developing psychotic

Table 2 Risk factors for developing psychotic symptoms

	Sample (n = 1,268)		CIDI (+) (n = 46)		B	OR	95% CI	P
	N	%	N	%				
Gender								
Female	663	52.3	29	63.0	0.892	2.44	(1.18–5.06)	0.017
Male	605	47.7	17	37.0		1.00		
Alcohol use								
Positive	177	14.0	15	32.6	1.60	4.93	(2.30–10.59)	<0.001
Negative	1,091	86.0	31	67.4		1.00		
Social support								
Positive	1,097	86.5	29	63.0		1.00		
Negative	171	13.5	17	37.0	1.50	4.47	(2.32–8.63)	<0.001
Prevalence of any mental disorders in 1° relatives								
Positive	29	2.3	9	19.6	2.63	13.93	(5.66–34.26)	<0.001
Negative	1,239	97.7	37	80.4		1.00		

symptoms [6]. Rossler et al. [31] have found that the use of cannabis at age 20/21 was the most prominent predictor to develop schizophrenia nuclear symptoms during 20-year follow-up period. In our sample, the use of cannabis was found in only three people (0.2%) and those individuals did not have any psychotic symptoms during CIDI interview. Prevalence of alcohol and substance use in our study was considerably low in comparison to other countries. This finding is consistent with the studies relevant to substance use among clinical or community samples in Turkey [2, 3]. Religious and cultural norms might be mostly related with lower substance use.

Although it was reported that no significant association was found between alcohol use and psychotic experiences [45], we found that alcohol use was an important risk factor for psychotic symptoms in our sample. People who had alcohol use had approximately five times more risk for developing CIDI psychotic symptoms compared to people who had no use of alcohol. Alcohol, cannabis, cocaine, alone or in various combinations, were abused among schizophrenia patients and are more related to increased positive symptoms and decreased negative symptoms [35]. It has been found that alcohol use in African American first episode schizophrenia-spectrum patients living in urban areas was related to psychotic symptoms [10]. Both alcohol and substance use are related to dopamine mediated brain reward pathways in the mesocorticolimbic tracts [15]. Alcohol may have induced psychotic symptoms as in cannabis use by increasing dopamine in the mesolimbic areas of the brain of people whose brains had been sensitized due to the genetic and neurodevelopmental factors [9].

Having a family history of any mental disorders was associated with psychotic symptoms as a risk factor in this Turkish population. In a population-based cross-sectional study conducted in Trabzon, Turkey, 4,832 people aged 15–45 years were screened for psychotic disorders with CIDI 2.1. In this study, lifetime prevalence of schizophrenia was found as 0.94%. Having a family history of any psychiatric disorder, socioeconomic status and stressful life event history were found as risk factors for schizophrenia [22]. Although having a family history of any psychiatric disorder was associated with psychotic symptoms, the prevalence of psychiatric family history was low in our entire population. Low prevalence might arise from recall bias of respondents. Also respondents might be reluctant to report any mental illness in their families due to stigmatization.

People who have been included into the study and reported as having less or no social support were four and half times more likely to develop psychotic symptoms. Social support is a very important factor as a psychosocial risk factor in the stress-diathesis model of schizophrenia. Veling [43] found that the incidence of psychotic disorders was elevated most significantly among immigrants living in neighborhoods where their own ethnic group comprised a small proportion of the population. Social support may have a protective effect for the people in preventing them to develop psychosis.

We did not perform the clinical interview to evaluate the final diagnosis of the cases that tested positive on the CIDI in this study. Therefore, there may be some false positive and negative results in the sample population. Besides, CIDI also has some limitations to detect psychotic symptoms [11]. For instance, the CIDI item detecting catatonia (G22) was emphasized during the training of lay interviewers, however, it might be still endorsed by the respondents reporting non-psychotic musculo-skeletal or normal sleep-related phenomenon leading to high prevalence of catatonia in our population. Furthermore, psychotic symptoms were rated by lay interviews that had been educated using CIDI, and may lead to bias to detect psychotic symptoms which could have been introduced during interview process. Data regarding alcohol and substance usage, smoking habits, medical illness history, social and financial support were obtained as reported by the interviewed people, therefore, sometimes they might not have declared the true information especially about cannabis use.

The most interesting and striking results of this study are lower rates of psychotic symptoms in the general population compared to European studies and the relation between alcohol use and psychotic symptoms. Both alcohol and cannabis may induce psychosis through sensitization of mesocorticolimbic mediated by dopaminergic system. This study has also showed that social support is much related to psychosis.

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