Self-Reported Psychotic Symptoms in the General Population: Correlates in an Iranian Urban Area

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Key Words

Comorbidity • Epidemiology • Paranoia • Psychosis • Psychotic-like experiences • Sociodemographic characteristics • Stressful life events • Symptom dimensions

Abstract

Background: Psychosis exists in the community as a continuum of severity. Here, we examine the correlates of self-reported psychotic symptoms in an urban catchment area of Iran. **Sampling and Methods:** Two thousand one hundred and fifty-eight participants (age 18–65 years) residing in southern Tehran (the capital city of Iran) were interviewed using the psychoticism and paranoia dimensions of the Symptom Checklist-90-Revised (SCL-90-R) to assess the severity of psychotic symptoms. Other dimensions of the SCL-90-R assessing nonpsychotic symptoms and a sociodemographic questionnaire were also used. Paykel's Interview for Recent Life Events was used to assess stressful life events. **Results:** Independent associations were observed between younger age, female gender, stressful life events and dimensions of depression, anxiety, hostility, obsessive-compulsive symptoms and interpersonal sensitivity and psychoticism. Independent associations were also observed for marital

problems, unemployment, stressful life events and dimensions of depression, anxiety, hostility, interpersonal sensitivity and phobic anxiety with paranoid ideation. There was also a trend toward an association between higher educational levels and the severity of psychotic symptoms, particularly paranoid ideation. **Conclusions:** Most of the previously accepted correlations for psychotic symptoms in the community were replicated. An unexpected association between paranoia and female gender, and a trend toward higher rates of psychotic symptoms in more educated participants, were in contrast with the studies in developed settings. The insufficient coverage of psychosis-relevant questions from the SCL-90-R for the entire psychotic diagnostic spectrum should be considered a limitation.

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Introduction

Psychotic symptoms such as hallucinations and delusions are commonly reported at subclinical levels in the community [1–5]. It has been shown that self-reported psychotic experiences in general population samples lie on a continuum with psychotic symptoms in clinical

samples [6]. In 2000, a 15-year follow-up by Poulton et al. [7] showed that high rates of psychotic experiences in adolescence predicted schizophreniform diagnosis at the age of 26 years. This association was specific to schizophreniform diagnosis and due to the link between child and adult psychotic symptoms. These results were replicated in a 21-year longitudinal study by Welham et al. [8] in which nonaffective psychosis was predicted by increased psychopathology during childhood and adolescence.

The risk factor profile of these nonclinical symptoms has been reported to be similar to that of clinical disorders [2, 6], has been regarded as disabling [9] and has been associated with violent behavior in at least one study [10]. A recent review of the population studies of risk factors for psychotic symptoms [11] outlined the previously shown associations of nonclinical psychotic symptoms with stressful life events [4, 12–14], single and divorced marital status [2, 5], unemployment [5, 9], lower socioeconomic status [2, 4, 5, 12] and nonpsychotic symptoms such as depression [2, 7, 13, 15–17], anxiety [7, 18–20] and hostility [21–23]. In addition, psychotic experiences have been shown to be associated with younger age [1, 2, 4, 6, 24] and some neurotic symptoms such as phobias [25, 26], obsessive-compulsive symptoms [25, 27], somatoform experiences [27–29] and interpersonal problems [30–32]. Depression, anxiety and interpersonal problems have been further reported to be commonly observed in the prodromal phase of psychotic disorders [20].

Despite the rich body of literature regarding psychotic experiences in the general population, there is a lack of related studies in developing countries of the Middle East. Considering the need for transcultural collaborations in this field, we decided to determine the correlates of self-reported psychotic symptoms in an urban general population in Iran.

Methods

Participants

This study was a secondary analysis of data from a population-based cross-sectional study in Tehran, Iran [33]. The study population consisted of 18- to 65-year-old individuals residing in the catchment area of the Abouzar health center. This is a densely populated region in the southern part of Tehran, the capital city of Iran, whose inhabitants mostly belong to the lower socioeconomic classes of the capital. The sample comprised 2,158 participants.

The sampling method was a two-stage random sampling from the households in the area. In the first stage, 5 out of 8 districts located in the area of the research center were selected by simple

random sampling. In the second stage, 2,158 people from the selected age range living in the 5 districts were recruited to the study and interviewed by systematic random sampling. If the selected participant was not present in the house or unable to provide a coherent interview, the interviewer left for the next dwelling. The refusal rate was low, at 4%.

Measures

To assess self-reported psychotic symptoms, we used the questions from two dimensions of the Symptom Checklist-90-Revised (SCL-90-R), namely 'paranoid ideation' and 'psychoticism' [34]. The SCL-90-R is a relatively brief self-report psychometric instrument (questionnaire) designed to evaluate a broad range of psychological problems and symptoms of psychopathology. The instrument is also useful for measuring patient progress or treatment outcomes. The 90 items of the SCL-90-R are grouped along 9 symptom dimensions reflecting broad psychological symptom status. 'Paranoid ideation' is a 6-item dimension that is characterized by projective thoughts, hostility, suspiciousness, grandiosity, centrality, fear of loss of autonomy and delusions. The 'psychoticism' dimension (10 items) includes items indicative of a withdrawn, isolated and schizoid lifestyle as well as items representing symptoms of psychosis and schizophrenia, such as hallucination and thought broadcasting. Other dimensions of the SCL-90-R were used to study the other mental (nonpsychotic) associates of the psychotic symptoms. These include depression, anxiety, phobic anxiety, somatization, hostility, obsessive-compulsive symptoms and interpersonal sensitivity. Participants responded on a 5-point Likert scale of distress ranging from 'not at all' (0) to 'a little bit' (1), 'moderately' (2), 'quite a bit' (3) and 'extremely' (4). The time period covered by the SCL-90-R in this study was 4 weeks. The SCL-90-R has shown good consistency and test-retest reliability [35, 36]. Its Persian-language version has also been reported to have adequate psychometric properties [37]. However, its interpretability and utility as a self-report measure have been criticized. Denial, minimization of symptoms and bias are three mechanisms which could cause inaccurate reports [38]. To examine these mechanisms for the two psychosis-relevant dimensions in the present study setting, we ran a parallel study to detect the discriminative validity and the resultant utility of these two dimensions. The self-reported scores of a group of 90 psychiatric patients were compared with their clinician-based DSM-IV diagnoses. The sample consisted of 34 patients clinically diagnosed with nonpsychotic disorders or psychotic disorders in remission, 29 patients with psychotic disorders and 27 patients with nonpsychotic disorders with psychotic features. The interviewers were blinded to the clinical diagnosis of the participants. A univariate analysis of variance (ANOVA) was used to compare the three diagnostic groups with regard to the means of their self-reported scores for the paranoid ideation and psychoticism dimensions.

For stressful life events, we used Paykel's Interview for Recent Life Events [39]. The participants were asked whether they had experienced any of the life events in the interview during the past 6 months and to describe the amount of psychological distress from each life event, scored from 1 to 20. We defined 2 variables for stressful events, i.e. the frequency (number) of stressful life events experienced in the last 6 months and the sum of the scores of the distressfulness of life events for each person in the same period. The Persian-language version of the instrument has been shown to be highly reliable [40].

Participants were interviewed by 15 health technicians and paramedical students. The interviewers were trained in a 3-day workshop and 1 briefing session with a master-level expert in clinical psychology. All the participants signed the informed consent forms, and confidentiality was protected. If the participants were illiterate, the questions were read to them and their answers were recorded.

Statistical Analysis

Analyses were conducted using the Statistical Package for Social Sciences, version 16. The two dimensions of psychotic symptoms from the SCL-90-R (paranoid thoughts and psychoticism) yield a score which arises from summing the scores for different questions in each dimension (0 to 23 for paranoid ideation and 0 to 40 for psychoticism). To examine the association of the above-mentioned nonpsychotic symptoms, stressful life events and demographic variables with the psychotic dimensions, we performed χ^2 tests, Pearson correlations, ANOVAs, independent-sample t tests and linear regressions.

Results

The study sample consisted of 2,158 participants with a mean age of 33.17 years (SD 12.45), 1,159 of whom were female (54.7%).

With regard to marital status, there were 5 categories: single (30.3%, $n = 653$), widowed (2.4%, $n = 51$), separated (0.45%, $n = 9$), married (66.4%, $n = 1,432$) and divorced (0.5%, $n = 11$). For educational attainment, there were 5 defined levels: illiterate (10.8%, $n = 233$), primary (18.6%, $n = 402$), intermediate (23.9%, $n = 515$), high school (37.5%, $n = 810$) and university degree (9.2%, $n = 198$). For job status, there were 5 categories: homemaker (40.3%, $n = 869$), laborer (8.6%, $n = 186$), employer (12.7%, $n = 273$), self-employed (17.1%, $n = 370$) and unemployed (11%, $n = 237$).

The average monthly income of the family caretaker in USD was divided into 4 categories: 62.5–93.75 (13.3%, $n = 286$), 93.75–125 (25.1%, $n = 541$), 125–156.25 (24.1%, $n = 521$) and 125–187.5 (19.9%, $n = 430$).

When considering the test for discriminative validity of the self-reported psychotic symptoms, using the data from psychiatric patients, a univariate ANOVA showed significant between-subject effects for both the paranoid ideation ($F = 11.7$, d.f. = 2, $p < 0.01$) and psychoticism dimension ($F = 8.2$, d.f. = 2, $p < 0.01$). Post hoc analysis (Tukey's honestly significant difference test) revealed that the patients with nonpsychotic disorders or psychoses in remission scored significantly lower on both dimensions (mean = 7.1, SD = 4.5 for paranoid ideation, and mean = 7.3, SD = 6 for psychoticism) than either the patients with psychotic disorders (mean = 12.9, SD = 4.7 for paranoid ideation, and mean = 13.4, SD = 7 for psychoticism) or the patients with nonpsychotic disorders with psychotic features (mean = 10.4, SD = 4.8 for paranoid ideation, and mean = 12.2, SD = 6.3 for psychoticism). The latter two groups did not show a significant difference from each other on either dimension. The results showed that the two self-reporting psychosis-relevant dimensions of the SCL-90-R were capable of detecting the psychotic symptoms in the present study setting.

Table 1. Correlation between two dimensions of psychosis in the SCL90-R (psychoticism and paranoid ideations) and age, stressful life events and nonpsychotic symptom dimensions in the SCL90-R

	Paranoia (Pearson's R)	Psychoticism (Pearson's R)
Age	−0.131	−0.112
Frequency of stressful life events (count)	0.408	0.369
Distressfulness of stressful life events (sum)	0.389	0.394
Somatization	0.573	0.647
Interpersonal sensitivity	0.726	0.766
Depression	0.695	0.771
Anxiety	0.663	0.759
Hostility	0.658	0.675
Phobic anxiety	0.575	0.716
Obsessive-compulsive symptoms	0.675	0.715

Stress count: the frequency (number) of stressful life events experienced in the last 6 months; stress severity sum: the sum of the scores of the distressfulness of stressful life events for each person in the last 6 months. $p < 0.01$ for all correlations.

Both SCL-90-R dimensions of psychosis were correlated with age, stressful life events and the dimensions of depression, anxiety, phobic anxiety, somatization, hostility, obsessive-compulsive symptoms and interpersonal sensitivity (table 1).

The severity of paranoid ideation and psychoticism was significantly higher among female compared with male participants. The mean paranoid ideation scores were not different across categories for marital status, but mean psychoticism scores showed a significant difference across these categories. There were significant differences across educational levels, job categories and income levels for both dimensions of psychosis, and contrary to our expectations, there was a trend toward more symptoms in subjects with higher levels of education ($F = 19.44$, d.f. = 1, $p < 0.01$, $R = 0.094$, and $F = 2.89$, d.f. = 1, $p < 0.01$, $R = 0.06$, for tests of linearity regarding paranoid and psychoticism symptoms, respectively). No significant linear

Table 2. Comparison of psychotic symptom dimensions across different subgroups of demographic variables

	Subgroup	Paranoid ideation score	p	Psychoticism score	p
Gender	male	6.07 ± 5.10	<0.01	4.20 ± 5.19	<0.01
	female	6.68 ± 5.03		5.64 ± 6.13	
Marital status	single	6.68 ± 5.40	NS	5.58 ± 6.25	0.01
	widowed	5.39 ± 4.85		5.39 ± 5.05	
	separated	6.44 ± 4.21		5.88 ± 6.54	
	married	6.31 ± 4.92		4.7 ± 5.53	
	divorced	7.81 ± 5.36		8.27 ± 7.19	
Educational level	illiterate	5.54 ± 4.44	<0.01	4.47 ± 4.86	<0.01
	primary	5.77 ± 4.52		4.49 ± 5.22	
	intermediate	6.26 ± 5.00		4.79 ± 5.41	
	high school	7.07 ± 5.40		5.58 ± 6.24	
	university degree	6.4 ± 5.29		4.86 ± 6.53	
Job	homemaker	6.49 ± 4.90	0.047	5.37 ± 5.69	<0.001
	laborer	6.12 ± 5.30		4.33 ± 5.41	
	administrative employee	5.83 ± 4.95		4.1 ± 5.33	
	self-employed	6.44 ± 5.11		4.45 ± 5.65	
	unemployed	7.22 ± 5.38		5.89 ± 5.72	
	other	6.11 ± 5.23		5.21 ± 6.84	
Average monthly income of the family caretaker (in USD) ¹	62.5–93.75	6.98 ± 5.68	0.035	6.05 ± 6.93	0.002
	93.75–125	6.59 ± 5.04		5.06 ± 5.65	
	125–156.25	5.87 ± 4.93		4.36 ± 5.55	
	125–187.5	6.45 ± 5.07		4.85 ± 5.60	
	other	6.42 ± 4.77		5.19 ± 5.36	

Scores are shown as means ± SD. ANOVA: post hoc tests (Tukey's honestly significant difference test and the least significant difference test) showed significant differences comparing married participants with single ($p < 0.01$) and divorced participants ($p = 0.041$) on the psychoticism dimension; significant differences between diploma level-educated participants and illiterate ($p < 0.01$ for paranoia and $p = 0.01$ for psychoticism), primary level-educated ($p < 0.01$ for both dimensions) and intermediate educated participants ($p < 0.01$ for paranoia and $p = 0.015$ for psychoticism); significant differences between unemployed individuals and laborers ($p = 0.028$ for paranoia and $p < 0.1$ for psychoticism), administrators ($p < 0.01$ for both dimensions) and self-employed participants ($p = 0.064$ for paranoia and $p < 0.01$ for psychoticism); significant differences between homemakers and laborers ($p = 0.025$), administrators ($p < 0.01$) and self-employed participants ($p = 0.01$) on the psychoticism dimension; significant differences between the lowest level of income and the second highest level on the paranoia dimension ($p < 0.01$) and the next three higher levels on the psychoticism dimension ($p = 0.018$, $p < 0.01$ and $p < 0.01$, for comparisons with the three higher groups of income in ascending order). NS = Not significant.

¹ At the time of the study.

trends were detected for the effect of income levels on the severity of psychotic symptoms. Table 2 shows the scores on both dimensions for the above-mentioned groups.

When considering nonpsychotic symptoms, a multiple regression analysis with a backward elimination method showed a significant positive linear correlation between the psychoticism dimension and the dimensions of depression, anxiety, hostility, phobias and interpersonal sensitivity. There was also a significant positive linear correlation between paranoid ideation and the dimensions of depression, anxiety, hostility, obsessive-compulsive symptoms and interpersonal sensitivity (table 3).

For paranoid ideation, additional associations were observed for age, sex and the frequency of stressful life events. There was also a trend toward a positive correlation between paranoid ideation and educational levels in the final regression model ($p = 0.073$). For the psychoticism dimension, further associations were observed between the sum of the distressfulness of stressful life events, marital status and job status. No significant association was observed between income level and either dimension of psychosis (table 3).

Table 3. Final multiple regression models examining associations between sociodemographic variables and nonpsychotic symptoms using 'paranoid ideations' and 'psychoticism' as dependent variables

	Independent variables	B	t	Significance	95% Confidence interval		sr ²
Paranoia	(constant)		3.829	0.000	1.138	3.527	0.001
	age	-0.042	-2.069	0.039	-0.033	0.000	0.0023
	sex	-0.050	-3.089	0.002	-0.830	-0.185	0.0007
	educational level	0.036	1.793	0.073	-0.015	0.328	0.0007
	stress count	0.180	4.550	0.000	0.160	0.403	0.0049
	depression	0.091	2.615	0.009	0.012	0.082	0.0016
	anxiety	0.102	3.439	0.001	0.030	0.111	0.0028
	hostility	0.159	6.597	0.000	0.134	0.247	0.0104
	interpersonal sensitivity	0.333	11.573	0.000	0.229	0.322	0.032
Psychoticism	OCD	0.141	4.894	0.000	0.069	0.162	0.0057
	(constant)		-2.172	0.030	-1.126	-0.057	0.0013
	marital status	-0.038	-2.800	0.005	-0.445	-0.078	0.0013
	responder job	0.039	2.785	0.005	0.038	0.221	0.0006
	stress severity	0.030	1.972	0.049	0.000	0.007	0.0065
	depression	0.172	6.131	0.000	0.070	0.136	0.0094
	anxiety	0.192	7.337	0.000	0.114	0.197	0.0029
	hostility	0.083	4.112	0.000	0.061	0.171	0.0198
	interpersonal sensitivity	0.260	10.637	0.000	0.204	0.296	0.019
	phobic anxiety	0.219	10.386	0.000	0.265	0.389	0.0013

B = Beta coefficient, i.e. the change in psychotic symptom score per change in independent factor; sr² = squared semicorrelation coefficient, which shows the extent of variance defined specifically by each independent variable; OCD = obsessive-compulsive dimension; stress count = the frequency (number) of stressful life events experienced in the last 6 months; stress severity = the sum of scores for distressfulness of stressful life events for each person in the last 6 months.

Discussion

We observed strong associations between dimensions of nonpsychotic symptoms and self-reported psychotic symptoms from dimensions on the SCL-90-R, with some exceptions (e.g. somatization was not associated with either of the dimensions, phobia was not associated with paranoia and the obsessive-compulsive dimension was not associated with psychoticism). Nevertheless, because our study used a cross-sectional design, disentangling the exact nature of these associations is not possible, and we cannot know whether these reported psychotic symptoms are a part of these nonpsychotic syndromes or whether the nonpsychotic syndromes are triggered by these psychotic symptoms [17]. Another theory proposed is that psychotic symptoms are risk factors for both psychotic and mood disorders [17].

As reported in previous studies, age was shown to be negatively correlated with both aspects of psychosis, albeit with a small R value (table 1). Linear regression confirmed these results for paranoid ideation but not for the psychoticism aspect of psychosis. The same results were

shown in the British National Psychiatric Morbidity Survey [4], in which there was a significant association between age and paranoid thoughts and no association between age and psychotic and hallucinatory experiences. Indeed, the dimensional view of the correlation between the intensity of psychotic symptoms and age, which has some supporting evidence [24, 41], requires more attention in future studies.

The intensity of stressful life events was shown to be associated with both aspects of psychosis, which is in line with the evidence for a predictor role of these events in the proposed stress-gene interaction model for the prediction of psychosis [42].

We observed a higher severity of psychoticism and paranoid ideation among women, which was supported by the multiple regression analysis for paranoia. In general, the prevalence of nonclinical psychotic symptoms seems to be equal for both genders, with more negative symptoms and paranoid ideation in males and more hallucinations and magical thinking for females [4, 43–45]. Our results indicating more paranoid ideation observed in females were contrary to some previous research find-

ings [4, 46, 47]. This observation requires further replication in other studies before a hypothesis can be proposed.

In line with previous research, single or divorced marital status and unemployment were reported to be correlated with the psychoticism dimension of our questionnaire, which includes core schizophrenia symptoms in the first four questions. However, contrary to previous work, we failed to confirm the associations between psychotic symptoms and lower income and lower education in secondary analysis. Unexpectedly, we observed a trend in which people with higher educational levels showed higher rates of psychotic symptoms in post hoc analyses. Moreover, there was a tendency toward a positive linear correlation between educational level and paranoid symptoms, which is in contrast with most previous studies that have indicated that more paranoid symptoms are associated with lower levels of education. The idea has been postulated in one other study – and, interestingly, in a nondeveloped setting like the present study – that there is a strengthening effect of higher education on the prevalence of delusional ideation for urban dwellers [48]. Those authors correlated this phenomenon with more aspirations and ambitions and more resultant disappointments due to a lack of infrastructure for this more educated group. They have proposed that the resulting discrepancy between this educated group's notion of actual self and ideal self is a mechanism for delusional ideas. It seems that this trend needs more investigation as it relates to psychopathology in developing countries.

Our study sample size seems to be large enough to generalize the results, but the self-rating nature of the instrument (SCL-90-R) requires reliance on individuals to correctly interpret their conditions. This creates limitations for the instrument to assess psychotic symptoms [37]. Through a parallel study, we demonstrated the capability

of the self-report to assess the two psychosis-relevant dimensions of the SCL-90-R in the present study setting. There is at least one other study that proves the capability for the other dimensions of the SCL-90-R in the Iranian population [49]. Moreover, not all the symptoms required in the DSM-IV and ICD-10 for the diagnosis of schizophrenia, schizotypal personality disorders or other psychotic disorders are part of the SCL-90-R, and therefore some symptoms are not included in our study. Another limitation was the uncertain nature of the two dimensions of psychosis in the SCL-90-R [35, 50], which necessitates confirmatory factor analyses in future studies.

In conclusion, in a nondeveloped setting, we found that the severity of psychotic symptoms in the general population correlated with stressful life events and most of the nonpsychotic symptoms. However, we were unable to make any judgment on the nature of the associations. Social losses, such as marital loss and unemployment, showed correlations with the psychoticism dimension of the SCL-90-R, including the core schizophrenia symptoms. A dimensional correlation between psychotic symptoms and age was also observed. In contrast with some previous studies, there were higher scores on paranoid ideas for females and a tendency for more educated participants to show more psychotic symptoms. Further research about the real nature of these correlations should be conducted.

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