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Immigration and Psychosis in the Population of Qatar: A Retrospective Study

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Abstract

Introduction: Qatar is a developing Arab country with a population that consists mostly of immigrants. This study assessed the associations between immigration and psychosis in Qatar and the factors contributing to the new diagnosis of psychosis.

Methods: Data was collected retrospectively for all patients with psychotic disorders over two years. The patients' records were retrieved from the Mental Health Services in Doha, Qatar.

Results: The percentage of international immigrants presenting with a diagnosis suggestive of the first onset of psychosis was higher than that of Qataris and Arabs. The latter two groups had more chronic forms of psychosis, mainly schizophrenia. International immigrants received the lowest dosage of antipsychotics. There were minor differences in the psychotic and treatment profiles.

Conclusion: Language, family structure, and other social-cultural factors might contribute to this new onset of psychosis among international immigrants in Qatar.

Keywords: Diagnosis • Clinical features • Immigrants • Psychosis • Qatar

Abbreviations: FGI: First-Generation Immigrants; SGI: Second-Generation Immigrants; PANSS: Positive and Negative Syndrome scale for Schizophrenia; GCC: Gulf Cooperation Council; HMC: Hamad Medical Corporation; IRBs: Institutional Review Boards; WCMQ: Weill Cornell Medicine in Qatar; DSM-IV: Diagnostic Statistical manual of Mental disorders; IQR: Interquartile Range; IBM-SPSS: IBM-Statistical Package for the Social Sciences

Introduction

The literature has shown an association between immigration and developing psychosis, where the risk was higher in immigrants than in natives [1]. The risk of schizophrenia in First-Generation Immigrants (FGI) was 2.7 times higher than in locals. Meanwhile, for Second-Generation Immigrants (SGI), the risk was even 4.5 times higher [2]. However, research showed that the FGI and SGI did not differ in the incidence rate, but the immigrants' ethnicity and host country affected that rate [3,4]. This ethnicity factor was also relevant among immigrants in Australia, Finland, and Sweden [5-7]. Others recognized that this risk is differentially affected by immigrants' country of origin and the family structure upon migration [8-10]. Furthermore, researchers showed this higher risk was in ethnic minorities, mainly those who migrated younger [11]. However, the risk was unrelated to settling in urban *versus* rural areas.

Other studies assessed if there are differences in the clinical presentations and treatment outcomes. Berg and colleagues compared the symptom profiles of immigrants and non-immigrants in Norway who had psychosis [12]. The Positive and Negative Syndrome scale for Schizophrenia (PANSS) measures showed no significant differences between the psychosis profiles of the two groups. Another study found no significant association between immigration and resisting treatment for schizophrenia [13]. However, compliance with assessment and therapy differed between immigrants and natives [14]. A study in Canada followed immigrants and non-immigrant patients who presented with first-episode psychosis. Immigrants were three times more likely to refuse treatment, regardless of whether they were FGI or SGI [15]. Another qualitative study assessed the barriers mental health service providers face in their assessments of immigrants with psychosis. Accordingly, the most critical challenges were cultural context, language, and support from social and health services. There was a common difficulty in communicating symptoms, cultural beliefs, norms, and fears that were barriers to treatment.

Traditional cultural beliefs in native countries were sometimes mistaken for psychopathology [16]. Qatar has one of the highest Gross Domestic Products (GDP) globally, making it an attractive country for foreign workers [17]. The number of immigrants in Qatar and other Arab countries in the Gulf Cooperation Council (GCC) has increased exponentially [18]. Qatar's immigrants comprise 85% of the population and have emigrated from many countries. Arab immigrants make up 14%, whereas Qatari nationals make up 14% of the people in Qatar [18]. However, the association between psychosis and immigration has not been studied enough in the GCC. This study compares the prevalence of psychotic disorders between immigrants and non-immigrants living in Doha, Qatar. Accordingly, the study aimed to determine if immigration is a risk factor for the onset of psychosis. Since Qatar has a large community of immigrants, the study team hypothesized that more subjects with first psychotic episodes would be among immigrants

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than Qataris. This research also compared the psychiatric and treatment profiles of these two groups. Immigrants were further divided into Arabs (non-Qataris) and international immigrants. The decision to include Arabs as a separate category is because they are more stable in Qatar, speak the same language, and share the same ethnicity as natives.

Materials and Methods

Setting and study design

This retrospective study is part of a project to assess the biopsychosocial profiles of patients with psychotic disorders at the mental health services, Hamad Medical Corporation (HMC) in Doha, Qatar. This hospital is the only psychiatric facility in Qatar with approximately 70 inpatient beds (the average occupancy rate is 95%) and ten outpatient clinics with more than 100 visits daily. Upon the approval of the Institutional Review Boards (IRBs) at HMC and Weill Cornell Medicine in Qatar (WCMQ), the study team started retrieving the patients' records, covering retrospectively the patients seen in the previous two years. In addition, this study reports on the relationships between the immigration status of subjects and having a psychotic disorder.

Participants and measures

The inclusion criteria were age above 18 and having a primary psychotic disorder such as schizophrenia, brief psychotic disorder, schizophreniform, delusional disorder, substance-induced psychotic disorder, or psychotic disorder not otherwise specified. The clinical diagnoses (discharge diagnosis for the inpatients) of the subjects were retrieved from the records based on the assessments of the treating psychiatrists. The Diagnostic Statistical Manual of mental disorders (DSM-IV) was used to determine the diagnosis. The number of patients' records analysed for this study was 404. The variables assessed for this study were prepared after carefully reviewing the literature. After piloting these variables on 20 records to ensure comprehension and feasibility, a manual was developed with codes to be used by all the staff entering the data from the records. The data analysed for this study covered sociodemographic (including the patient's nationality), clinical features, psychiatric diagnosis, and treatment regimen. The patients' nationality in the records is based on their official national identification (Qatar ID given to all immigrants and nationals). A team of health practitioners was trained and supervised to enter the data required for analysis. Inter-reliability was confirmed by having 100 records inputted by two independent raters blind to each other's entries (Cohen's kappa=0.94).

Data analysis

The target sample with psychotic disorders was divided into three groups: Qatari nationals, Arab immigrants, and international immigrants. Continuous variables such as age and days of hospitalization are described as means and standard deviations or as the median and Interquartile Range (IQR) when a variable is not normally distributed. Categorical variables like gender and marital status are presented as frequencies and percentages. The groups were compared using the different factors, chi-square for categorical variables, and ANOVA for continuous ones. The Kruskal-Wallis test was used for continuous variables that did not follow the parametric assumptions. The Statistical Package for the Social Sciences (IBM-SPSS, version 23.0) was used to run the various analyses. As per the SPSS, the significance level was set at 0.05 (p-value<0.05), and Bonferroni corrections were selected to account for multiple comparisons.

The study team tried to include only the variables with data in the records, but some data were still missing. To control for missing values, the data were disregarded if the variables had more than 25% missing data. Also, the missing data were included as a separate category. The results were not interpreted if the analysis showed this category was significant.

After controlling for the other relevant factors, a multivariate analysis was conducted using binary logistic regression to assess the association between immigrants and first-onset psychosis. The outcome was first onset psychosis (any psychotic disorder including brief psychotic disorder and schizophreniform disorder with no previous history of psychosis) *vs.* chronic psychotic disorders (schizophrenia, schizoaffective, and delusional disorder). The predictors were age, gender, nationality (Nationals, Arab and international immigrants), marital status, and job status. The goodness of fit was tested using the Nagelkerke Pseudo R^2 test.

Results

Sociodemographic characteristics of the sample

Table 1, shows the detailed results in the three groups: Nationals (N=99, 24.5%), Arab immigrants (N=70, 17.3%), and international immigrants (N=235, 58.1%). The mean age of the sample was 32.52 ± 9.30 years. The percentage of males in the sample was 68%, while that of the females was 32%. The age and gender variables were not significantly different among the three groups. There was a trend for the mean age of international immigrants to be younger than the Qataris, but this did not reach statistical significance. There were more males than females in each of the groups. All the Qataris and Arabs were Muslims, while the majority in the third group were also Muslims (46.8%). The educational level showed a high proportion of missing data; thus, comparisons are invalid. The marital status (x^2 (6)=49.96, p<0.001) and work status (x^2 (6)=126.76, p<0.001) were significantly different among the three groups. Bonferroni-corrected paired comparisons showed a significantly higher percentage of married patients among international immigrants than nationals and Arab immigrants. Qataris and Arabs were more likely to be divorced in the sample. Similarly, there were significantly more employed subjects in the international group than in the Qataris and Arabs groups. Most Qataris and Arabs had families in Qatar and lived with them, but statistically significant missing data hindered further analysis as shown in Table 1.

Table 1. Socio-Demographics across groups.

Variable	A: Nationals N=99	B: Arab Immigrants N=70	C: International Immigrants N=235
Age mean ± SD	34.23 ± 10.68	33 ± 10.55	31.63 ± 8.17
Gender n (%)			
Male	66 (66.7%)	52 (74.3%)	156 (66.4%)
Female	33 (33.3%)	18 (25.7%)	79 (33.6%)
Religion n (%)			
Muslim	99 (100%)	70 (100%)	111 (47.2%)
Christian	0 (0%)	0 (0%)	50 (21.3%)

Other	0 (0%)	0 (0%)	61 (26.0%)
Not Documented	0 (0%)	0 (0%)	13 (5.5%)
Marital status n (%)			
Married	27 (27.3%)	19 (27.1%)	127 (54.0%) AB
Single	53 (53.5%)	45 (64.3%) C	95 (40.4%)
Divorced/Divorced	18 (18.2%) C	6 (8.6%) C	6 (2.6%)
Not documented	1 (1.0%)	0 (0%)	7 (3.0%)
Education level n (%)			
No schooling	3 (3.0%)	2 (2.9%)	10 (4.3%)
Elementary/Intermediate	15 (15.2%)	9 (12.9%)	37 (15.7%)
Secondary/High school	31 (31.3%)	21 (30.0%)	36 (15.3%)
Vocational degree	1 (1%)	1 (1.4%)	1 (0.4%)
College/Postgraduate Degree	13 (13.1%)	20 (28.6%)	24 (10.2%)
Not documented	36 (36.4%)	17 (24.3%)	127 (54.0%)
Work status n (%)			
Not employed	72 (72.7%) C	42 (60.0%) C	41 (17.4%)
Employed	15 (15.2%)	20 (28.6%)	162 (68.9%) AB
Student	3 (3.0%)	6 (8.6%) C	4 (1.7%)
Not documented	9 (9.1%)	2 (2.9%)	28 (11.9%)
Living conditions n (%)			
Alone	2 (2%)	2 (2.9%)	11 (4.7%)
Sponsor or Coworkers	0 (0%)	1 (1.4%)	95 (40.4%) B
Family	90 (90.9) BC	54 (77.1%) C	57 (24.3%)
Other	5 (5.1%)	7 (10.0%)	22 (9.4%)
Not documented	2 (2%)	6 (8.6%)	50 (21.3%) A
Having family in Qatar? n (%)			
Yes	99 (100%)	57 (81.4%) C	67 (28.5%)
No	0 (0%)	3 (4.3%) C	97 (41.3%)
Not documented	0 (0%)	10 (14.3%) C	71 (30.2%)

Note: The key to the smaller category appears in the category with the larger proportion for each statistically significant pair. The significance level for upper case letters (A, B, C): p<0.05 across groups: Nationals, Arab Immigrants, and International Immigrants; Arab immigrants were from Algeria, Bahrain, Egypt, Iraq, Jordan, Lebanon, Mauritania, Morocco, Oman, Palestine, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, and Yemen. International immigrants are from Afghanistan, Bangladesh, India, Indonesia, Iran, Nepal, Pakistan, Sri Lanka, Thailand, Armenia, Burkina Faso, Canada, China, Czech Republic, Eritrea, Ethiopia, France, Ghana, Ireland, Kenya, Mali, Nigeria, North Korea, South Africa, South Korea, Tanzania, Uganda, United Kingdom, and the United States of America.

Psychiatric features across groups

Table 2, shows the psychotic symptoms and diagnoses across the three groups and the significant pair comparisons. The diagnosis of psychosis was significantly different among the three groups (x^2 (10)=125.22, p<0.001). Post-hoc comparisons showed that the percentage of patients with schizophrenia was significantly higher in the national and Arab groups compared to international immigrants. In addition, the proportion of subjects with a brief psychotic disorder was substantially higher in international immigrants than in the other two groups. There were no significant differences in the age of onset of a psychotic disorder among the three groups. The psychotic symptoms were dichotomized (present *vs.* absent), and their frequencies were analyzed individually in the three groups using the chi-square test. The psychotic feature hallucinations (x^2 (2)=9.47, p=0.009) were significant and more frequent in Arabs than in international immigrants. For thought disorder (x^2 (2)=5.55, p<0.06), there was a clear trend where Arabs showed the highest percentage of thought process psychopathology. The delusions, catatonia, and negative symptoms showed no significant differences between the three groups. Moreover, the history of suicidal attempts and substance use were not significantly different as shown in Table 2. The most common substance used was nicotine (through smoking cigarettes), followed by alcohol and smoking marijuana.

Treatment profiles across groups

Patients were mainly on Second-Generation Antipsychotics (SGA). A good number were on a combination of First-Generation Antipsychotics (FGA) and SGA. Also, some patients were not on any antipsychotics. The type of antipsychotics received by each group was significantly different in the three groups (x^2 (6)=13.24, p=0.04). Post-hoc comparisons showed that more Qataris were on SGA than international immigrants. The chlorpromazine equivalent dose of antipsychotics was significantly different among the three groups (Kruskal-Wallis H=10.97, df=2, and p=0.004), where the international immigrants received a lower dose than the other two groups [19]. Notably, 22 (9.4%) patients in this group were not taking antipsychotics. Patients were also on several other psychotropic medications like anxiolytics, antidepressants, anticholinergics, and mood stabilizers, but there were no significant differences among the three groups as shown in Table 3. In addition, the duration of the last hospitalization was not significantly different among the three groups. However, the disposition after the previous hospitalization was significantly different (x^2 (10)=108.06, p<0.001). The proportion of subjects from the nationals and Arab immigrants referring to outpatient clinics for follow-up was significantly higher than that of international immigrants. The latter had a significant percentage of subjects leaving the country after discharge as shown in Table 3.

Multivariate analysis

Multiple logistic regression was applied to analyze the outcome of the first onset *versus* chronic psychosis. The independent predictors were age, gender, nationality (nationals, Arab, and international immigrants), marital status, and job condition. The full regression model was significant (x^2=142.44, df=4, p<0.001). The Nagelkerke R^2 showed that the model explained 46% of the variance predicted by these independent variables. The Hosmer and Lemeshow test confirmed this model is a good fit (x^2=6.66, df=6, p=0.35). The overall success rate in this model was also 76.9%. The results showed that international immigrants were at 10.32 times higher odds of having first-onset psychosis than nationals (p<0.001) over the two years of the study, while the odds for Arab immigrants were only 2.42 times higher than nationals (p=0.08). Females had 3.58 times higher odds (p<0.001), and being employed had 5.26 times higher odds (p<0.001) of having the same outcome of the first onset of psychosis as shown in Table 4.

Table 2. Psychiatric profile across groups.

Variables	A: Nationals N=99	B: Arab Immigrants N=70	C: International Immigrants N=235
Diagnosis n (%)			
Schizophrenia	82 (82.8%) C	54 (77.1%) C	62 (26.4%)
Schizoaffective	2 (2.0%)	2 (2.9%)	5 (2.1%)
Delusional disorder	1 (1.0%)	1 (1.4%)	2 (0.9%)
Brief psychotic disorder	11 (11.1%)	13 (18.6%)	159 (67.7%) AB
Schizophreniform	0 (0%)	0 (0%)	2 (0.9%)
Psychotic disorder NOS	3 (3.0%)	0 (0%)	5 (2.1%)
Age of onset (mean ± SD)	26.03 ± 5.59	27.17 ± 6.79	27.44 ± 4.82
Psychotic symptoms			
Delusions	44 (44.4%)	35 (50.0%)	87 (37.0%)
Hallucinations	54 (54.5%)	42 (60%) C	98 (41.7%)
Thought Disorder	25 (25.3%)	22 (31.4%)	44 (18.7%)
Catatonia	0 (0.0%)	2 (2.9%)	9 (3.8%)
Negative symptoms	11 (11.1%)	6 (8.6%)	23 (9.8%)
History of suicidal attempts	9 (9.1%)	6 (8.6%)	26 (11.1%)
History of substance use	21 (21.2%)	8 (11.4%)	34 (14.5%)

Note: The key to the smaller category appears in the category with the larger proportion for each statistically significant pair. Significance level for upper case letters (A, B, C): p<0.05 across groups: Nationals, Arab Immigrants, and International Immigrants. SD: Standard Deviation; NOS: Not Otherwise Specified.

Table 3. Treatment profile across the groups.

Variable	A: Nationals N=99	B: Arab Immigrants N=70	C: International Immigrants N=235
Antipsychotics n (%)			
FGA	27 (27.3%)	23 (32.9%)	77 (32.8%)
SGA	57 (57.6%) C	36 (51.4%)	96 (40.9%)
Combination of both	9 (9.1%)	10 (14.3%)	40 (14.0%)
None	6 (6.1%)	1 (1.4%)	22 (9.4%)

AP chlorpromazine	541.89 (621.38) C	537.35 (612.98) C	423.54 (445.81)
Equivalent Dosage (M, IQR)			
On Anxiolytics n (%)	5 (12.2%)	3 (10.3%)	18 (14.5%)
On Antidepressants n (%)	22 (20%)	10 (14.3%)	60 (25.3%)
On Anticholinergic n (%)	12 (12.1%)	16 (22.9%)	36 (15.2%)
On Mood Stabilizer n (%)	17 (17.1%)	8 (11.4%)	28 (11.8%)
Days of Duration of last hospitalization (mean ± SD)	12.41 ± 7.95	13.51 ± 7.61	12.40 ± 7.84
Disposition after hospital			
Outpatients follow up	84 (84.8%) C	59 (84.3%) C	113 (48.1%)
Travel back to home	0 (0.0%)	8 (11.4%)	113 (48.1%) B
Community care	8 (8.1%)	1 (1.4%)	0 (0.0%)
Transfer to another hospital	1 (1.0%)	0 (0.0%)	1 (0.4%)
Others	5 (5.1%)	1 (1.4%)	6 (2.6%)
Not documented	1 (1.0%)	1 (1.4%)	1 (0.9%)

Note: The key to the smaller category appears in the category with the larger proportion for each statistically significant pair. Significance level for upper case letters (A, B, C): p<0.05 across groups: Nationals, Arab Immigrants, and International Immigrants. FGA: First-Generation Antipsychotic; SGA: Second-Generation Antipsychotics; SD: Standard Deviation; M, IQR: Median and Interquartile Range.

Table 4. Multivariate analysis: Factors associated with first-onset psychosis.

Variable	OR	OR 95% CI	P-value
Age	0.39	0.95-1.02	0.39
Gender, female *vs.* male	3.58	1.91-6.71	<0.001
Marital status, single *vs.* married	0.82	0.47-1.45	0.5
Job status, employed *vs.* not	5.26	2.76-10.01	<0.001
Arab immigrants *vs.* nationals	2.42	0.86-6.67	0.09
International immigrants *vs.* nationals	10.32	4.32-24.65	<0.001

Note: OR: Odds Ratio; 95% CI: 95% Confidence Interval.

Discussion

This study assessed the associations between first-onset psychosis and immigration in the population of Qatar. As per the objectives, this study aimed to evaluate three groups (Qataris, Arab immigrants, and international immigrants), comparing their sociodemographic, psychiatric features, and treatment profiles.

The sample of this study had more Qataris and Arab immigrants (41.8%) than the nationality distribution known in Qatar, where they represent only 28% [20]. This is probably because Qataris and Arabs are the most stable population in Qatar, while the other international expatriates leave the country once diagnosed with a psychotic disorder. The male-to-female ratio in Qatar was slightly above 2, as many male laborers come to work in Qatar without their families. All the Qataris and Arabs were Muslims, which is the case in most Arab countries. Most of these two groups were single, unemployed, and living with family. They have chronic mental disorders (schizophrenia spectrum disorders) as shown in Tables 1 and 2, so they usually depend on their family financially. However, most international immigrants were Muslims, married, employed, and lived with sponsors or co-workers. The current study did not have data on the group's religious practices, but earlier studies have suggested that such practices can lower psychological stress among immigrants [21]. Unemployment was shown to increase the risk of psychosis among migrant groups [22]. However, most people with recent onset of psychosis were employed in our sample. Most of the international workers were from Bangladesh, India, Nepal, and Pakistan, where there are also a considerable number of Muslims. All the international workers are required to have a local sponsor who usually provides housing, and most of these labourers come without their families to work in Qatar and send money back to their homes. The educational level was not different among the three groups. Still, there was a sizable number of missing data for this variable, especially for international immigrants, who also had the youngest average age in our sample. A Netherlands study showed that a more youthful generation during migration was associated with a higher incidence of psychosis among immigrants [23].

The multivariate analysis confirmed that international immigration in Qatar is an independent predictor of having first-onset psychosis (about ten times more risk than Qataris) as shown in Table 4, even after controlling for age, gender, marital status, and job status. A recent international systematic review also confirmed that immigrants' odds of having non-affective psychosis are higher compared to natives. The study also showed that men living in urban areas with low socioeconomic status have higher odds of psychosis [4]. According to Dykxhoorn et al., factors such as age, gender, income, and the period in which immigration happened did not influence the risk of psychotic disorders among immigrants [8]. Our results showed that age and marital status were insignificant after

controlling for the other confounders. Employment remained significant in this population because all expatriates arrive in Qatar with an existing job contract and must maintain their jobs for residency. The majority in the group with first- onset psychosis were employed (n=130, 66.0%). Our analysis suggests that employment might be stressful in the immigrant population of Qatar. A study from Spain also concluded that stress at a job was the primary association with immigrants' psychopathology [24]. Other international studies showed that the male gender is independently associated with psychosis, especially for immigrants from the Middle East and North African region residing in Europe [25]. However, our analysis showed that females are more likely to develop first-onset psychosis in Qatar's population (natives and immigrants). Other studies have shown that female immigrants are more prone to psychological symptoms and distress than natives [26]. It is worth noting that international females who reside in Qatar are also employed. In addition to the work stress, females might be at higher risk of not seeking help, especially if they immigrated alone and without their families [8].

This study assessed the three groups regarding psychiatric diagnosis and other psychotic features over two-year periods. The results showed that the onset of psychosis was significantly higher in international immigrants than in Arab immigrants and native Qataris. In contrast, Qataris had more schizophrenia, which is known to be a chronic psychotic disorder. Thus, although the proportion of Arabs was higher than that of Qataris, it did not reach significance as shown in Table 2. These two groups showed a higher proportion of patients with schizophrenia spectrum disorders. There were no significant differences between the Arabs and Qataris regarding the onset of psychosis or schizophrenia. We opted to study Arabs as a separate group from other nationalities because they understand the country's official language, share a common religion and culture, and tend to be more stable regarding the length of stay.

Previous studies have shown that immigration increases the risk of developing psychosis [27,28]. This higher risk in two generations of immigrants of diverse ethnicities indicated that social adversity could contribute to this risk [2,29,30]. Language is essential to health care services, especially in the mental health services [31]. Many international workers in Qatar do not speak Arabic or English, the commonly spoken language among psychiatrists and other health practitioners. Although patients who speak a language foreign to the psychiatrist are usually seen with an interpreter, the language barrier and cultural differences could lead to differences in the assessment and treatment of international immigrants.

Other comparative studies showed that diverse immigrants who differ in culture and appearance from the host population are at increased risk for psychosis [32]. For instance, like Qataris, most Arabs lived with their families. This family support might be a protective factor for Arabs living in Qatar. Carta et al., also found that having a family might decrease the risk of developing psychosis in immigrants [31]. The family presence and acculturation might also explain why we have more schizophrenia patients among Arabs and Qataris, as their families in Doha support them. At the same time, international immigrants with psychosis would lose their sponsorships and leave Qatar to be with their families in their home countries as shown in Table 3. Other studies have shown that post-traumatic stress disorder and adjustment disorders were misidentified as psychosis among immigrants and refugees from South Asia [33]. Arab and Qatari patients usually reside with families who typically know their history and symptoms and can communicate them with the physician, which might change the diagnosis. The relationships between family structure and mental health and how family interventions can contribute to the treatment of patients with schizophrenia have been demonstrated by these research studies in Egypt [34,35]. We believe that once diagnosed with a long-term mental illness, immigrants who do not have family support might find it difficult to stay in a foreign country with a long- term psychotic disorder. Immigrants adapt better in places where communities are similar to their ethnic background than those without similar communities [36]. A study from the United Arab Emirates reported on the patterns of psychiatric diagnoses in a local psychiatric hospital [37]. It showed that psychotic disorders were the most common diagnoses, and these disorders were significantly more common in expatriates when compared to Emiratis. Other international studies have concluded that such variations in rates and relative risks for the development of psychosis indicate a possible etiological role of social and environmental experiences in immigrants [38-41].

The psychotic symptoms across the groups were somewhat similar in the three groups, with a preponderance of positive symptoms as shown in Table 2. Our results showed that Qataris and Arab immigrants showed a higher percentage of hallucinations than international immigrants, but this difference was only significant between Arab and international immigrants as shown in Table 2. Other studies have shown that hallucinations were more common in immigrants than in natives. However, the association between ethnicity and hallucinations diminished after adjustment for social adversity, which supports the view that adverse social experiences contribute to the higher rates of psychosis among migrants [42].

The results showed that there were also differences in the treatment profile across groups. Again, the difference was not between Qataris and Arabs but only between international immigrants and Qataris or Arabs. International immigrants received the lowest dosages of antipsychotics. One plausible explanation for this group's lower antipsychotic dose is that they most likely had early-onset psychosis and were primarily treated with lower dosages when under observation. Another possibility is the financial status of the immigrants who are workers without families to afford a higher dosage of medications. The hospitalization duration did not vary among the three groups. Lee et al., analyzed hospital admissions and durations for 106 hospitals in the United States [43]. They found that the mean duration of hospital stay was 10 ± 3 days; however, the time varied based on the hospitals and the severity of patients admitted. In Qatar, the government covers the hospital stay for all Qataris and expatriates, increasing the admission rates as physicians do not consider the patient's financial ability (or availability of insurance coverage) when deciding on the need for hospitalization. Other studies have indicated that we should account for the different social and cultural factors to prevent differences in psychiatric care [44].

Conclusion

More international immigrants had a new onset of psychosis than native people in Qatar within the study's time frame. However, the psychiatric profile was not different among Qataris, Arabs, and international immigrants. In addition, international immigrants received a lower dosage of antipsychotics, but the length of stay at the hospital was not different among the three groups. Prospective studies are needed to assess the relationships and determine the causality between immigration and the development of psychosis in Qatar while controlling for possible confounding factors, such as evaluating social/family support, having a history of mental illness, and overcoming the language barrier with the health care professionals.

Strengths and Limitations

The study has several strengths, such as the design, the manual preparation to collect data, and the proper training of raters. However, several limitations might hinder the generalizability of the results. First, a retrospective study does not adequately interpret the associations and findings. Second, there was missing data for some variables, but we had enough data on other variables to achieve the study's objectives. Third, the language barrier, the concern of losing their jobs, and losing continuity of care among international immigrants might compromise disclosing their past psychotic experiences. Thus, more prospective studies to follow up on newly diagnosed patients with psychotic disorders and proper interpreters to adequately cover the history and follow-ups would help better identify the risk factors for developing psychosis in Qatar's immigrants.

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Authors' contributions

A.Y. was responsible for statistical analysis, manuscript preparation, and study implementation. H.A. and S.G. designed and implemented the methods and supervised all study aspects, including manuscript preparation. N.F., H.A., and I.B. contributed to the design and grant proposals. S.H. and Y.H. finished the questionnaires and data collection. N.A., M.S., H.G., H.I., and Y.H. collected the data. All authors contributed and approved the manuscript before submission.

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Availability of data and materials

The data and material used during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The IRBs at HMC and WCMQ approved the study, which was exempt from written consent as it was a retrospective study with no subjects' identifiers.

Consent for publication

Not applicable

Conflict of interest

The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

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