

RESEARCH

Open Access



# Psychiatric patients: who brings them? And why?

Mehran Zarghami<sup>1</sup>, Narjes Rezaee Roshan<sup>2</sup> and Amirmasoud Taheri<sup>3\*</sup> 

## Abstract

**Background** The characteristics of people admitted to psychiatric wards act as one of the indicators of the performance of the service system as a whole. The characteristics of these people and how they are referred to psychiatric hospitals vary in different communities. The aim of this study was to investigate the demographic and clinical characteristics of patients with mental disorders who were referred to Zare Hospital in Sari, the capital of Mazandaran province in the north of Iran, in 2020, based on their referral sources in order to better provide a health care system.

**Results** The mean age of patients (male = 827, female = 293) was  $38.25 \pm 11.88$ . 84.2% were referred by family, 12.7% by judicial authorities, 1.7% by police, 0.9% by themselves, and 0.5% by other sources. The most common cause of referrals in all cases was aggression, and the most common diagnosis class was psychotic disorders with the highest frequency in the family referral group. About 21% of patients had methamphetamine abuse, of which about 20% were referred by the court and police.

**Conclusions** The high prevalence of aggression and substance abuse raises the need to set up special services for such patients with the cooperation of mental health professionals, judicial authorities, and the police.

**Keywords** Aggression, Court, Mental health, Police, Psychiatric services

## Background

Approximately 29.2% of people will suffer from a mental illness at some point in their lives [1]. In addition to the negative effects that these disorders have on the patient, they have a significant impact on the social environment around them [2]. Some of these patients need to be hospitalized. Epidemiological studies have also shown that the reasons of admission are different in various nations [3], and it seems that the sources of referral may depend more on patients' past psychiatric history, type of the

disorder and behavioral problems, access to drugs and types of drugs of abuse, social circumstances, common sense, and other cultural parameters rather than codified rules, at least in developing countries. Individuals' lifestyles and whether they live alone or with their families vary from country to country. Centers involved in the management and treatment of psychiatric disorders and addiction also vary from region to region. All of these factors affect the characteristics of patients referred by different sources to the psychiatric centers. Therefore, different psychiatric wards may differ markedly between nations and even in different regions of a nation in terms of the clinical characteristics of patients referred from different sources.

Although most people with psychiatric disorders are not aggressive, but there is an increased risk of aggression in patients with mental disorders. Violence is one of the primary causes for admission to psychiatric inpatient wards. About 10–30% of patients of psychiatric units have engaged in aggressive behavior prior to

\*Correspondence:

Amirmasoud Taheri  
t.amirmasoud@yahoo.com

<sup>1</sup> Psychiatry and Behavioral Sciences Research Center, Addiction Institute and Department of Psychiatry, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

<sup>2</sup> Student Research Committee, Faculty of Medicine, Islamic Azad University, Sari Branch, Sari, Iran

<sup>3</sup> Student Research Committee, Mazandaran University of Medical Sciences, Farah-Abad Road, P.O Box 48471-91971, Sari, Iran

hospitalization [4–6]. On the other hand, many researchers believe that people with mental illness are less likely to enter the mental health system as a result of the limited standards for referral to a psychiatric hospital and instead are more likely to be shifted to the criminal justice system as a result of their actions and society's limited tolerance for them [7]. The psychiatric emergency department is a critical entry point into psychiatric care, and knowing who brought the patient there can reveal a great deal about the patient's social network and performance [8]. In many communities, the police are the most common source of referrals to psychiatric emergency services [9] and play an important role in providing mental health services [10]. In fact, the police serve as a conduit between the mental health and criminal justice systems [11]. When it comes to police engagement in mental health care, violence is frequently the determining factor. Mobile psychiatric emergency teams that include only mental health professionals may not have safe equipment to respond to physical violence or threats. As a result, the police are usually the ones who deal with people who have violent behavior or who are potentially hazardous [9]. On the other hand, the extent of police involvement/intervention reflects the extent of health care problems and the social protection system [12]. Because mental disorders have become increasingly common in recent years, in case that these people commit a crime, these patients should be appropriately diagnosed with the right referral system so that they can seek treatment rather than end up in prison. The findings show that collaboration between the criminal justice system, mental health system, and legal community, as well as appropriate services, can reduce the usage of prisons as a holding facility for people with acute psychiatric symptoms [13]. Given the cultural, religious, and economic differences of Iran compared to other regions, based on the above considerations, to better understand the demographic and clinical characteristics of patients referred by various sources, especially the reasons that lead to police or judicial action, the goal of the research team was collecting information about patients referred to the psychiatric referral center of Mazandaran province in northern Iran in 2020 by various sources. To our knowledge, this research is the first to look into this topic in Iran.

## Methods

In this cross-sectional descriptive study that was performed in Zare burn and psychiatric specialty and subspecialty hospital in Sari, Mazandaran province, northern Iran, the medical records of 1130 patients (all admitted in 2020) from six psychiatric wards (including 216 beds) were reviewed. Individuals were divided into 5

groups based on their sources of referral: (1) self-referral, (2) referred by the police, (3) referred by legal authorities, (4) referred by friends and family, and (5) referred by other sources like social workers or referred by other hospitals. A checklist was used to categorize the data like patient's age, gender, marital status, education, occupational status, living location, past psychiatry history, chief complaints, and reasons of referral. The data was analyzed using SPSS version 21. For qualitative data, the chi-square test was utilized, and for quantitative data, the ANOVA was used. A significant correlation was defined as a  $p$ -value of less than 0.05. The study was reviewed and approved by the ethical research committee of Islamic Azad University (IR.IAU.SARI.REC.1398.197).

## Results

Our study involved 1130 patients (male = 827, female = 293) with an average age of  $38.25 \pm 11.88$  years. Most of the patients were referred by friends/family members [ $n=952$  (84.2%)]; others were referred by legal authorities [ $n=144$  (12.7%)], police [ $n=19$  (1.7%)], and other sources [ $n=5$  (0.5%)]. Ten patients had come for hospitalization themselves. Age and referral sources did not have a statistically significant relationship ( $p>0.05$ ). Male patients were more common in all categories of referral ( $p<0.05$ ). There was no statistically significant correlation ( $p>0.05$ ) between marital status, education, occupational status, living location, alcohol consumption, and homicidal ideas, with referral categories. In the family referral groups, suicidal thoughts and positive past psychiatric history were substantially more common ( $p<0.05$ ). Table 1 shows the demographic and clinical characteristics of patients referred by different sources.

The frequency of the patients according to the reason and source of referrals is shown in Table 2. According to the findings, the most common chief complaints/reasons of referral across all types of referral was aggression, with suicidal ideation coming in second. Also, referrals from family, legal authorities, and police had the highest frequency, respectively. According to the results, there was a significant difference between various referral sources and aggressive behavior ( $p<0.05$ ).

As shown in Table 3 in all groups, non-substance abusers were more prevalent, followed by smokers, amphetamine/methamphetamine users, and opium users. Among amphetamine/methamphetamine and opium users after referral by family, legal authorities have been the next most frequent source of referral. Nearly half of the people in the cases referred by the police abused multiple substances which amphetamine/methamphetamine and cannabinoid substances were the most common co-abuse. According to

**Table 1** Demographic and clinical characteristics of patients referred by different sources to the psychiatric wards of Zare Hospital, Sari, Iran

Parameters	Frequency (percent)	Self-refer	Referred by the police	Referred by legal authorities	Referred by friends and family	Others	Chi-square (except age row)	df (except age row)	p-value
<b>Age</b>	38/25 (11/88) <sup>a</sup>	33/89 (13/06)	38/37 (11/88)	38/64 (10/39)	38/19 (12/11)	48/91 (10/94)	F test: 1.51	R square: 0.005	0.3
<b>Gender</b>									
Male	837 (74/1)	7	14	131	681	4	24.79	4	<0.0001
Female	293 (25/9)	3	5	13	271	1			
<b>Marital status</b>									
Single	507 (44/8)	5	10	68	422	2	3.79	12	0.98
Married	389 (34/5)	3	4	50	330	2			
Divorced	217 (19/2)	2	5	25	184	1			
Widow	17 (1/5)	0	0	1	16	0			
<b>Education</b>									
Illiterate	56 (5)	1	1	6	47	1			
Elementary	283 (25)	3	8	29	242	1			
Primary high school	337 (29/8)	0	6	44	286	1	17.17	16	0.37
High school diploma and associate degree	369 (32/6)	4	4	51	309	1			
BSC and upper	85 (7/5)	2	0	14	68	1			
<b>Occupational status</b>									
Employed	201 (17/8)	1	2	32	165	1			
Unemployed	614 (54/3)	7	17	110	469	4	22.9	16	0.11
Home maker	251 (22/2)	0	0	0	258	0			
Student	29 (2/6)	0	0	0	25	0			
Retired	34 (3)	0	0	0	34	0			
Soldier	1 (0/1)	0	0	0	1	0			
<b>Living location</b>									
Urban	761 (67/3)	9	16	92	639	5	8.35	4	0.07
Rural	369 (32/6)	1	3	52	313	0			
<b>Past psychiatry history</b>									
Yes	839 (74/2)	7	12	95	723	2	10.98	4	0.02
No	291 (25/8)	3	7	49	229	3			
<b>Ideas about killing</b>									
Suicidal idea	278 (24/6)	5	2	23	246	1	10.11	4	0.01
Homicidal idea	273 (24/2)	1	5	34	228	1	1.17	4	0.88
<b>Total</b>		10 (0.9)	19 (1.7)	144 (12.7)	952 (84.2)	5 (0.5)			

df degrees of freedom

<sup>a</sup> The age parameter is given as the mean and standard deviation

**Table 2** Frequency of chief complaints/reasons of referral of the patients by different sources of referral

CC/RR	Self-refer	Referred by the police	Referred by legal authorities	Referred by friends and family	Others
Bizarre thoughts	0	0	0	8	0
Delusions	0	0	1	15	0
Aggression	3	12	123	691	3
Hallucination	1	0	2	19	0
Refusal to eat	0	0	0	2	0
Logorrhea	0	0	1	10	0
Refusal to treat	0	0	0	15	0
Fire setting	0	0	0	3	0
Bizarre behavior	0	0	2	20	0
Suicidal idea/attempt	3	0	2	58	1
Suicide attempt	2	0	1	27	1
Inappropriate laughter	0	0	0	1	0
Unplanned home-leaving	0	2	3	24	0
Self-harming	0	0	1	3	0
Insomnia	0	0	0	3	0
Suspiciousness	0	0	1	6	0
Incoherence	0	1	2	22	0
Feeling depressed	1	0	0	6	0
Obsession	0	0	0	4	0
Self-talking	0	0	0	18	0
Restlessness	0	0	0	3	0
Social withdrawal	1	0	0	4	0
Nudity in public	0	3	0	2	0
Bullying	0	0	1	0	0
Drug side effects	0	0	0	1	0
Homicide	0	0	0	3	0
Poverty of speech	0	0	0	3	0
Amnesia	0	0	0	2	0
Loss of consciousness	0	0	0	0	1
Headache	0	0	0	1	0
Blasphemy	0	0	1	0	0
Increased libido	0	0	0	1	0
Extramarital relationships	0	0	1	0	0
Elevated mood	0	0	0	3	0
Drug withdrawal	1	0	0	0	0
Homelessness	0	1	0	0	0
Rape	0	0	1	0	0
Irritability	0	0	0	1	0

RR chief complaints/reasons of referral

the results, there was no significant relationship between different sources of referral and abusing substances ( $p>0.05$ ).

Table 4 shows the results of the frequency of referrals by diagnosis. Substance-induced disorders were the most common. According to the findings of this study, there was no significant difference between different referral sources and psychotic disorders ( $p>0.05$ ).

## Discussion

Mental health issues are becoming more prevalent all around the world. Many factors influence mental health, including demographic factors [14, 15], socioeconomic conditions [16, 17], and health behavior, as well as environmental influences [18–20]. Because of the importance of proper diagnosis in psychiatric disorders, as well as the

**Table 3** Frequency of drug abuse of the patients<sup>a</sup>

Abused substance	Self-refer	Referred by the police	Referred by legal authorities	Referred by friends and family	Others	Chi-square	df	p-value
None	5	8	70	510	3	2.24	4	0.69
Morphine	0	0	0	9	1			
Crack cocaine	0	0	4	14	0			
Amphetamine/methamphetamine	0	6	46	215	0			
Benzodiazepine	0	0	1	8	1			
Buprenorphine	1	0	0	0	0			
Tramadol	1	0	0	8	0			
Methadone	1	3	4	50	0			
Cannabis	0	1	6	56	0			
Opium	2	1	9	68	0			
Heroin	0	0	2	8	0			
Cigarette <sup>a</sup>	3	3	37	249	1			
Alcohol	2	2	25	159	0			
Other	0	0	0	1	0			

<sup>a</sup> Alone or in combination with other drugs

**Table 4** Frequency of referrals by diagnosis

Diagnose	Self-refer	Referred by the police	Referred by legal authorities	Referred by friends and family	Others
No psychiatric disorder	0	0	1	0	0
Psychotic disorders	1	7	68	404	3
Bipolar disorder	0	4	20	186	0
Depressive disorder	4	0	2	51	0
Cluster A personality disorder	0	0	0	1	0
Cluster B personality disorder	4	2	21	99	0
IDD	0	0	6	18	0
Substance-induced disorders	0	4	22	127	1
Neurocognitive disorders	0	0	0	6	0
OCD	0	0	0	10	0
PTSD	0	0	0	3	0
Adjustment disorder	0	0	1	3	1
ADHD	0	0	1	6	0
Autism spectrum	0	0	0	4	0
Lithium toxicity	0	0	0	1	0
Parkinson disease	0	0	0	1	0
Factitious disorder	1	0	0	1	0
Malingering	0	0	1	2	0
Discharged before final diagnosis, contrary to the doctor's opinion	0	2	1	29	0

IDD intellectual or developmental disability, OCD obsessive-compulsive disorder, PTSD post-traumatic stress disorder, ADHD attention-deficit/hyperactivity disorder

impact of these disorders on several aspects of social life, the need to research many aspects of the disorders has gained importance. On the other hand, the approach of initial exposure and referral of patients to the medical

system will be useful in determining patients' prognosis and proper management of hospitalized patients [21, 22]. As a result, the goal of this study was to investigate the demographic and clinical characteristics of a sample of

Iranian patients who were referred to the medical system from various sources. The focus of the investigation was the individuals who carried the patient to the psychiatric center. In this study, 1130 hospitalized patients with an average age of 38.25 were analyzed, of whom 74.1% were men. The average age of referrals from police and judicial authorities is about 38 years, which is consistent with Wang et al.'s findings [11].

Referrals from family and friends were the most common types of referral, accounting for 84.2% of cases. Referrals from the legal authorities and police were next, with a frequency of 14.4%. Psychotic disorders were the most common diagnosis of all referral groups. A positive past psychiatric history was found in 74.2% of the patients. Unemployment accounted for 54.3% of the population. Single people made up 44.8% of the population. To the best of our knowledge, there has not been any study conducted on the demographic and clinical findings of patients with mental disorders based on the referral sources in Iran. In Australia, Al-Khafaji et al. discovered that the majority of patients were referred by the police for substance-induced disorders [23], which contradicts our study's findings. In the current study, aggression was the most common reason for patient referrals from police (63%). Of course, the most common reason for referral in all cases and by all referral sources was aggression (about 74%), which is consistent with previous research [8, 9, 24]. In another study in Pakistan, however, aggression was the common reason for referral, but depression was the most common diagnosis [22]. Way et al. in their analysis of police referrals to 10 psychiatric emergency rooms revealed that police cases were different from non-police cases on dangerous behavior to others and impaired judgment as reasons for referral [10]. According to the findings of our study, despite the prevalence, clinical consequences, and effects of depression, a minority of referrals was due to depression. Of course, it should be noted that Zare Hospital is the province's main referral center for psychiatric patients, and patients who are uncontrollable in other psychiatric wards are referred to this hospital. As a result, psychotic patients occupy the majority of hospital beds, whereas non-psychotic individuals prefer to be admitted to other centers. About 48% of the individuals referred to the psychiatric wards in this study were drug or substance abusers. About half of the 400 psychiatric patients in a descriptive study in Hamadan, Iran, had a history of substance abuse [25]. Substance-induced disorders, on the other hand, came in third place in our study. Substance abuse is common among those with primary mental disorders, according to studies. Nearly half of the individuals with a history of schizophrenia have used drugs or alcohol at some point in their lives [26, 27]. In the present study, more

than half of the patients referred by the legal authorities were substance abusers, which were 28% and 22% in the study of Mngadi et al. [28] and Todd et al. [29], respectively. Methamphetamine was the most abused substance in our study, which is consistent with other studies [29]. On the other hand, alcohol use was reported to be 16.6% in our study which is lower than Kassew et al.'s study [30]. In interpreting this finding, we must pay attention to the religious and cultural limitations as well as people's reticence to admit to drinking [31].

The fact that there were more men than women in all referral groups in our study is consistent with previous findings [25, 28, 29, 32–34]. In our society, it is probably preferred to control women at home, or it is easier to keep women at home against their will and seek treatment there. In addition, men are more likely than women to abuse substances [35, 36]. However, in Wang et al.'s study, 52% of the cases referred by the police are related to women, contradicting the findings of the current study [11]. The difference between different sources of referral was statistically significant in our study, which is similar to Wang et al.'s findings and contrary to Maharaj et al.'s findings [11, 37].

In our study, patients with a previous history of psychiatric disorders were significantly more likely to be referred for treatment than those who had no previous history. Such a finding has not been reported in the study by Way et al. [10].

Among all referrals, there were more single patients, but there was no statistically significant difference between marriage and type of referral. People with mental illness marry at a lower rate than the general population, so it is impossible to say with certainty that marriage protects them. However, in a multinational study, Breslau et al. discovered that mental problems are frequently associated with divorce [31].

Having a job is essential for married men's and women's mental health. According to the Statistical Center of Iran, the unemployment rate in Iran was 9.6% in summer 2021 [38]. This figure was 54.3% in our patients. In all patients referred from all sources, the unemployed were more than the employed. But there was no significant relationship between unemployment and the source of referral. Mental disorders affect learning and skills, lowering people's ability to find work. However, this relationship is two-way, and unemployment can be itself a source of mental illness or may act as a precipitating factor in predisposed patients for psychiatric disorders. On the other hand, many people commit crimes due to a lack of employment and a source of income. Those accused of crimes referred to in South Africa were also often unemployed [28, 39, 40].

The majority of patients who had suicidal thoughts or attempts were referred by their families in this study. These are usually not aggressive patients who need police intervention. Approximately 10% of all cases referred by the police tend to commit suicide. However, in Wang et al.'s study, suicide attempts and thoughts were the most common reason for police referrals, accounting for 89% of all referrals [6]. This difference can be attributed to differences in the structure and cultural role of the family in different nations. In our study, we found a significant association between different sources of referral and suicidal ideas, whereas Maharaj et al. did not find a significant relationship in this regard [37].

In the three groups of self-referral, referral from family, and referral from judicial authorities, most people had high school diplomas and associate degrees, while when it came to police referrals, primary education was the most common which is consistent with the finding of Mngadi et al.'s study [28]. Previous research has indicated that the greater the level of education, the more voluntary referrals to mental health treatment facilities there are than the lower level of education [41]. Some authors believe that education may act differently upon rates of service use by the type of mental health services examined [41].

We showed that in all types of referral, patients live more in urban areas. By 2050, it is estimated that 67% of the world's population will live in urban areas [42]. Some studies have found that health in cities is better than in rural areas, mainly due to better education and access to health care [43, 44]. But there are studies that show that anxiety disorders, mood disorders, and substance-induced disorders are the most common life-threatening disorders in large cities [45].

In conclusion, the majority of patients referred to Zare Hospital's psychiatric ward from a variety of sources are unmarried, middle-aged, unemployed men with a high school diploma or associate degree who have a positive past psychiatric history and are admitted by family members due to aggression. The majority of referrals from the judicial system and the police are psychotic and aggressive patients that abuse mainly methamphetamine.

In this study, the self-referrals were a minority of cases (0.9%) and chief complaints/reasons of referral for hospitalization are in favor of the reluctance of most patients to be hospitalized; from the source of referrals recorded in the charts, it seems that the hospitalization was against the patient's wishes. But it cannot be said definitively. In some cases, patients may have been admitted at their own request and may have been accompanied or referred by others. Of course, referrals by judicial authorities, and especially by the police, are unlikely to be part of this group of patients. Most of the

cases referred by the police and the judge are aggressive patients that the family is unable to handle. In other words, due to the lack of a clear law and procedure for hospitalization against the patient's wishes, in cases where family and friends are able to control them, there is no need for judicial and police intervention and patients are hospitalized against their will.

## Conclusions

The results of this study should be interpreted within the limitations of a retrospective cross-sectional chart review. The data concerning who carried the patient to the hospital was accessible in the patients' charts. We trust this information. But it is not clear from the contents of the charts why these individuals brought the patient to the hospital and why no help was sought from other sources. The lack of a global assessment of functioning scores in the medical records, which clarifies patients' function, was another study limitation.

Further investigations are suggested to explore the socioeconomic state, social functioning and patients' relationships, and the relationship between these variables and source of referrals.

Given that the trend for community-based psychiatry has increased contact between police and psychiatric patients [13], similar studies are suggested at other times.

## Acknowledgements

Declared none.

## Consent

Informed consent for the publication of this case report was taken from the patient.

## Authors' contributions

MZ conceived and designed the evaluation, interpreted the clinical data, and revised the draft of the manuscript critically for important intellectual content. NRR involved in designing the study, collected the clinical data, participated in the interpretation of the clinical data, and drafted the manuscript. AT involved in the collection and interpretation of the data and drafting the manuscript. All authors reviewed and approved the final version of the manuscript.

## Funding

None.

## Availability of data and materials

The data are available with the corresponding author and can be achieved on request.

## Declarations

### Ethics approval and consent to participate

The study was approved by the ethical research committee of Islamic Azad University (IR.IAU.SARI.REC.1398.197).

### Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

**Competing interests**

The authors declare that they have no competing interests.

Received: 30 December 2022 Accepted: 14 February 2023

Published online: 24 March 2023

**References**

- Steel Z, Marnane C, Iranpour C, Chey T, Jackson JW, Patel V et al (2014) The global prevalence of common mental disorders: a systematic review and meta-analysis 1980–2013. *Int J Epidemiol*. 43(2):476–493
- Boekhoudt L (2016) Behavioural effects of chemogenetic dopamine neuron activation [dissertation]. Utrecht Univ, Utrecht
- Preti A, Miotto P (2000) Increase in first admissions for schizophrenia and other major psychoses in Italy. *Psychiatry Res*. 94(2):139–152
- Olupona T, Virk I, Ishola A, Akerele E, Moddy K (2017) Aggression rate in acute inpatient psychiatric units: impact of substance abuse and psychosis. *MOJ Addict Med Therapy*. 3:15–17
- Weltens I, Bak M, Verhagen S, Vandenberk E, Domen P, van Amelsvoort T et al (2021) Aggression on the psychiatric ward: prevalence and risk factors. A systematic review of the literature. *PLoS One* 16(10):e0258346
- Caruso R, Antenora F, Riba M, Belvederi Murri M, Biancosino B, Zerbinati L et al (2021) Aggressive behavior and psychiatric inpatients: a narrative review of the literature with a focus on the European experience. *Curr Psychiatry Rep* 23(5):29
- Teplin LA (1984) Criminalizing mental disorder: the comparative arrest rate of the mentally ill. *Am Psychol*. 39(7):794
- Dhossche DM, Ghani SO (1998) Who brings patients to the psychiatric emergency room? Psychosocial and psychiatric correlates. *Gen Hospital Psychiatr*. 20(4):235–240
- Redondo RM, Currier GW (2003) Characteristics of patients referred by police to a psychiatric emergency service. *Psychiatr Serv*. 54(6):804–806
- Way BB, Evans ME, Banks SM (1993) An analysis of police referrals to 10 psychiatric emergency rooms. *Bull Am Acad Psychiatry Law*. 21(4):389–397
- Wang JP, Wu CY, Chiu CC, Yang TH, Liu TH, Chou P (2015) Police referrals at the psychiatric emergency service in Taiwan. *Asia Pac Psychiatr*. 7(4):436–444
- Livingston JD (2016) Contact between police and people with mental disorders: a review of rates. *Psychiatr Serv*. 67(8):850–857
- Steadman HJ, Deane MW, Borum R, Morrissey JP (2000) Comparing outcomes of major models of police responses to mental health emergencies. *Psychiatric Serv*. 51(5):645–649. <https://doi.org/10.1176/appi.ps.51.5.645>
- Barua A, Ghosh MK, Kar N, Basilio MA (2010) Socio-demographic factors of geriatric depression. *Indian J Psychol Med*. 32(2):87–92
- Chong MY, Tsang HY, Chen CS, Tang TC, Chen CC, Yeh TL et al (2001) Community study of depression in old age in Taiwan: prevalence, life events and socio-demographic correlates. *Brit J Psychiatr*. 178(1):29–35
- Hoebel J, Maske UE, Zeeb H, Lampert T (2017) Social inequalities and depressive symptoms in adults: the role of objective and subjective socioeconomic status. *PLoS one*. 12(1):e0169764
- Freeman A, Tyrovolas S, Koyanagi A, Chatterji S, Leonardi M, Ayuso-Mateos JL et al (2016) The role of socio-economic status in depression: results from the COURAGE (aging survey in Europe). *BMC Public Health*. 16(1):1098
- Ailshire J, Karraker A, Clarke P (1982) Neighborhood social stressors, fine particulate matter air pollution, and cognitive function among older U.S. adults. *Soc Sci Med* 17(172):56–63
- Attademo L, Bernardini F, Garinella R, Compton MT (2017) Environmental pollution and risk of psychotic disorders: a review of the science to date. *Schizophrenia Res*. 181:55–59
- Dales RE, Cakmak S (2016) Does mental health status influence susceptibility to the physiologic effects of air pollution? A population based study of Canadian children. *PLoS one*. 11(12):e0168931
- Kim J, Kim H (2017) Demographic and environmental factors associated with mental health: a cross-sectional study. *Int J Environ Res Public Health* 14(4):5
- Yousafzai AW, Jehangiri AU, Kazim M, Shah M (2015) Demographic and clinical characteristics of patients referred to psychiatric unit in a tertiary care hospital. *J Ayub Med Coll Abbottabad* 27(1):208–211
- Al-Khafaji K, Loy J, Kelly AM (2014) Characteristics and outcome of patients brought to an emergency department by police under the provisions (Section 10) of the Mental Health Act in Victoria, Australia. *Int J Law Psychiatr*. 37(4):415–419
- Broussard B, McGriff JA, Demir Neubert BN, D'Orio B, Compton MT (2010) Characteristics of patients referred to psychiatric emergency services by crisis intervention team police officers. *Commun Ment Health J*. 46(6):579–584
- Ghaleiha A, Zarabian MK, Haghghi M, Bahrami MH (2010) Surveying substance abuse frequency in hospitalized patients in psychiatric ward of Farshchian Hospital in Hamadan. *Avicenna J Clin Med*. 17(1):52–55
- Kavanagh DJ, Waghorn G, Jenner L, Chant DC, Carr V, Evans M et al (2004) Demographic and clinical correlates of comorbid substance use disorders in psychosis: multivariate analyses from an epidemiological sample. *Schizophrenia Res*. 66(2):115–124
- Regier DA, Farmer ME, Rae DS, Locke BZ, Keith SJ, Judd LL et al (1990) Comorbidity of mental disorders with alcohol and other drug abuse: results from the Epidemiologic Catchment Area (ECA) study. *JAMA*. 264(19):2511–2518
- Mngadi S, Tomita A, Khanyile V, Chiliza B (2021) The profile of suspected criminal offenders referred for psychiatric evaluation on an outpatient basis at Ngwelezana Hospital 27:3–5
- Todd TL, Chauhan P (2021) Seattle Police Department and mental health crises: arrest, emergency detention, and referral to services. *J Criminal Justice* 72:17–20
- Kassew T, Kiflie M, Minichil W, Tilahun AD, Liyew B (2021) Alcohol use disorder and its associate factors relating to patients with severe mental disorders attending psychiatric follow-ups in Northwest Ethiopia. *Neuropsychiatric Dis Treatment*. 17:1801
- Chegeni M, Kamel Khodabandeh A, Karamouzian M, Shokoohi M, Abedi L, Khalili M et al (2020) Alcohol consumption in Iran: a systematic review and meta-analysis of the literature. *Drug Alcohol Rev*. 39(5):525–538
- Mohammad M, Nastaran A, Ali K, Koorosh K, Seyed Ali M, Mehdi R et al (2018) Prevalence and correlates of psychiatric disorders in a national survey of Iranian children and adolescents. *Iran J Psychiatr* 14(1):4–5
- Bhogale GS, Katte RM, Heble SP, Sinha UK, Patil BA (2000) Psychiatric referrals in multispeciality hospital. *Indian J Psychiatr*. 42(2):188–194
- Chen C, Yeh S (1996) The present status of psychiatric consultation in Chang Gung Memorial Hospital, Keelung: a report of clinical characteristics. *Changcheng Yi Xue Za Zhi*. 19(4):331–336
- Greenfield SF, Back SE, Lawson K, Brady KT (2010) Substance abuse in women. *Psychiatric Clin*. 33(2):339–355
- National institute on drug abuse (2021) Substance use in women research report. [updated August 2021; cited January 2022]. Available from: URL: Sex and Gender Differences in Substance Use | National Institute on Drug Abuse (NIDA) ([nih.gov](https://www.nida.nih.gov))
- Maharaj R, Gillies D, Andrew S, O'Brien L (2011) Characteristics of patients referred by police to a psychiatric hospital. *J Psychiatr Ment Health Nurs*. 18(3):205–212
- Statistical Center of Iran (2021) Unemployment rate. [updated December 2021; cited January 2022]. Available from: URL: <https://www.amar.org.ir/english>
- Lee S, Brunero S, Fairbrother G, Cowan D (2008) Profiling police presentations of mental health consumers to an emergency department. *Int J Ment Health Nurs*. 17(5):311–316
- Vaus DAd (2002) Marriage and mental health: Australian Institute of Family Studies. 26–32 p.
- Steele LS, Dewa CS, Lin E, Lee KL (2007) Education level, income level and mental health services use in Canada: associations and policy implications. *Healthcare Policy*. 3(1):96
- Heilig GK (2012) World urbanization prospects: the 2011 revision. United Nations, Department of Economic and Social Affairs (DESA), Population Division, Population Estimates and Projections Section, New York. 14:555.
- Dye C (2008) Health and urban living. *Science (New York, NY)*. 319(5864):766–769

44. Lederbogen F, Haddad L, Meyer-Lindenberg A (2013) Urban social stress—risk factor for mental disorders. The case of schizophrenia. *Environmental pollution* (Barking, Essex: 1987). 183:2-6.
45. Andrade LH, Wang Y-P, Andreoni S, Silveira CM, Alexandrino-Silva C, Siu ER et al (2012) Mental disorders in megacities: findings from the São Paulo Megacity Mental Health Survey, Brazil. *PLoS one*. 7(2):e31879

### **Publisher's Note**

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

**Submit your manuscript to a SpringerOpen<sup>®</sup> journal and benefit from:**

- ▶ Convenient online submission
- ▶ Rigorous peer review
- ▶ Open access: articles freely available online
- ▶ High visibility within the field
- ▶ Retaining the copyright to your article

---

Submit your next manuscript at ▶ [springeropen.com](https://www.springeropen.com)

---