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Psychotropic medications: a descriptive study of prescription trends in Tabriz, Iran, 2021–2022

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Abstract

Introduction Mental disorders, such as anxiety and depression, significantly impacted global populations in 2019 and 2020, with COVID-19 causing a surge in prevalence. They affect 13.4% of the people worldwide, and 21% of Iranians have experienced them. Prescription analysis is critical for evaluating and improving medical care in a cost-effective manner. This study examined prescription patterns for psychotropic drugs in outpatient settings to improve the understanding of medication utilization in a variety of patients. It aimed to assist healthcare professionals in making well-informed decisions about drug prescriptions, a topic not much addressed in Iran.

Method A descriptive study was conducted using data extracted from the Social Security Organization in Iran. We analyzed prescriptions in Tabriz from March 2021 to March 2022. Prescription data were categorized by medication category, physician specialty, age group, and sex. Then statistical analysis was performed using SPSS 2022.

Results We analyzed the number of psychotropic medication prescriptions issued by 7246 doctors to a group of 413,466 individuals over a year representing 44.9% of our target population. The average age of individuals receiving psychotropic drugs was 45.57 years. Gabapentin had the highest prescription rate, followed by sertraline. Antidepressants accounted for 38.1% of all prescriptions, with anxiolytics accounting for 18.6%. Other psychotropic drugs included alprazolam, chlordiazepoxide, and valproate. Adults in all age groups had the highest frequency of prescriptions for psychotropic medications. The majority of patients were female (63.5%). General practitioners had the highest number of instances of prescribing psychotropic drugs, with psychiatrists contributing 54.7% of the total prescriptions.

Conclusion Approximately 45% of the target population received psychotropic medication, which highlights the significant prevalence of mental health issues in Iran. Antidepressants were the most commonly administered class, highlighting the need for training programs that specifically address their possible negative effects and the correct dosage. The goal is to provide healthcare practitioners with a comprehensive understanding of prescription trends, enabling them to administer the most appropriate treatments.

Keywords Psychotropic medications, Mental disorders, Prescription patterns, Gabapentin, Psychiatrists

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Introduction

Mental disorders refer to notable disruptions in cognition, emotional regulation, or behavior that are clinically severe. Typically, this leads to feelings of discomfort or difficulty in important areas of functioning.

In 2019, anxiety and depression were the prevailing mental disorders, impacting approximately 1 in 8 individuals globally, totaling 970 million people [1]. The prevalence of mental disorders in Iran is 31%, according to a study by Taheri et al. in 2020 [2]. The COVID-19 pandemic led to a significant surge in anxiety and depression in 2020 [3]. According to the one-year estimates, the prevalence of anxiety and severe depressive disorders increased by 26% and 28%, respectively. The majority of individuals with mental health conditions do not have sufficient access to efficient measures for prevention and treatment.

Mental disorders impose a significant burden on nations around the world. A total of 13.4% of people worldwide suffered from mental disorders in 2017 [4]. Overall, a recent comprehensive study revealed that 21% of Iranians 15 years of age and older have mental disorders overall. In addition to having a greater incidence than other countries, Iran has experienced a sharp increase in the incidence of mental diseases in recent years [2]. We regard the analysis of prescriptions as a component of "drug utilization," a comprehensive examination of the marketing, distribution, and prescription of various medications within society. Drug utilization studies monitor, evaluate, and improve medical care to make it cost-effective.

Many mental disorders are commonly treated with drugs. Stimulants, antidepressants, and antipsychotics play a crucial role in the treatment of different psychiatric disorders [5]. Several studies have examined and assessed prescription patterns in various healthcare settings, including general practice, specialist care, and emergency services, and across different age groups. Recent studies from multiple countries have shown an increase in prescriptions for various categories of psychotropic medications over the past few decades [6]. For instance, new studies in different countries have shown an increase in the use of medications for attention deficit hyperactivity disorder (ADHD) over the past twenty years [7]. Antidepressant drugs are advised for the treatment of anxiety and depression disorders. Mood stabilizers are mainly administered for bipolar disorder and schizophrenia patients. Stimulant drugs are generally acknowledged as an effective therapy for ADHD. Worldwide, there is a significant gap between the need for therapy and its actual availability. 33% of those with depression and 29% of those with psychosis seek professional mental health care [8]. Mentally ill people need help in making and maintaining social, familial, and intimate relationships.

We conducted this study to assess the prescription patterns for psychotropic drugs in outpatient environments with the aim of improving our understanding of the utilization of various medications in diverse patients, taking into account various factors. Our ultimate goal is to assist healthcare professionals in making well-informed decisions about drug prescriptions, a topic that has not received much attention in Iran.

Method

Study design

The primary objective of our thorough study was to identify new patterns in the administration of psychotropic drugs, taking into account variables such as drug type, patient age and sex, physician age (related to graduation year), and specific medical specialty. First, the list of psychotropic medications was extracted from the psychiatric references of Kaplan, Sadock, and Oxford. We examined the Iranian Pharmacopoeia and conducted a thorough assessment to determine the availability of drugs in Iran. The analysis distinguished six general classes of medications: antidepressants, antipsychotics, anxiolytics, mood stabilizers, stimulants, and others that were not particularly classified.

Data source

The Social Security Organization provided the data used in this study (Tamin Ejtemaei). The Social Security Organization (SSO) in Iran includes wage earners, paid employees, and self-employed people who voluntarily enlist. The government (3%), employers (20–23%), and insured individuals (7%), as well as other participating parties, fund the non-governmental organization SSO solely through contributions. We obtained prescriptions for psychotropic drugs that were available in Tabriz, Iran, between March 2021 and March 2022.

Data analysis

Before analyzing the data with SPSS 2022, we established the variables. The first variable was the frequency of each category and subsequent medications. The patients were divided into four groups according to age ranges: pre-adolescent and younger, adolescent, adult, and elderly. Next, we divided the individuals into male and female groups based on sex. Using their national physician number and graduation year as guides, we next examined the age of the physicians. Six different groups were established according to particular time periods: before 1979 (over 45 years of experience), from 1979 to 1987 (over 35 years of experience), from 1987 to 1997 (over 25 years of experience), from 1997 to 2007 (over 15 years of experience), from 2007 to 2017 (over 5 years of experience), and finally, from 2017 to 2022 (recently graduated). Furthermore, classification of medical practitioners

Farahbakhsh *et al. BMC Psychiatry*   (2025) 25:10

Page 3 of 10

Table 1 Psychotropic medication prescription frequency and percent in detail

Antidepressants[a]	Venlafaxine (1.3%, N:15,597)	Trimipramine (0.1%, N:1,702)	Aripiprazole (1.4%, N:16,142)	Thioridazine (0%, N:401)	Pregabalin (4.8%, N:56,210)	Trihexyphenidyle (0.4%, N:4,899)	Lorazepam (1%, N:11,275)
Sertraline (7.3%, N:85,517)	Imipramine (1.2%, N:13,983)	Maprotiline (0.1%, N:1,365)	Olanzapine (1.1%, N:12,924)	Thiothixene (0%, N:144)	Biperiden (1.1%, N:13,279)	Rivastigmine (0.2%, N:2,378)	Zolpidem (0.4%, N:4,296)
Nortriptyline (6.8%, N:79,438)	Fluvoxamine (1%, N:12,234)	Desimipramine (0%, N:270)	Perphenazine (0.7%, N:8,641)	**Mood stabilizers**	Topiramate (1%, N:12,220)	Naloxone (0%, N:47)	Oxazepam (0.3%, N:3,993)
Fluoxetine (6.8%, N:79,067)	Bupropion (1%, N:12,118)	Tranylcypromine (0%, N:16)	Haloperidol (0.5%, N:5,464)	Valproate (5%, N:58,453)	Amantadine (0.8%, N:8,896)	**Anxiolytics**	Flurazepam (0%, N:348)
Escitalopram (4.2%, N:48,488)	Clomipramine (0.8%, N:9,495)	**Antipsychotics[b]**	Chlorpromazine (0.5%, N:5,369)	Lithium (0.5%, N:6,256)	Clonidine (0.7%, N:8,065)	Alprazolam (5.2%, N:60,802)	**Stimulants**
Citalopram (2.7%, N:31,233)	Trazodone (0.6%, N:6,449)	Trifluoperazine (6.7%, N:78,543)	Clozapine (0.1%, N:1,245)	Lamotrigine (0.5%, N:5,743)	Atomoxetine (0.6%, N:7,525)	Chlordiazepoxide (5.1%, N:59,270)	Methylphenidate (0.8%, N:9,122)
Amitriptyline (1.7%, N:20,054)	Paroxetine (0.4%, N:4,090)	Risperidone (2.2%, N:25,974)	Fluphenazine (0%, N:513)	**Others[c]**	Memantine (0.6%, N:6,946)	Clonazepam (4.5%, N:52,964)	Lisdexamfetamine (0.2%, N:2,644)
Duloxetine (1.7%, N:19,561)	Mirtazapine (0.3%, N:3,687)	Quetiapine (2.1%, N:24,851)	Pimozide (0%, N:504)	Gabapentin (9.8%, N:114,405)	Donepezil (0.5%, N:6,347)	Diazepam (2.1%, N:24,206)	Modafinil (0.2%, N:1,792)

[a] In this study, MAOI, SSRI, TCA, TeCA, SNRI, SARI are considered as antidepressants

[b] Typical and atypical antipsychotics

[c] Anticonvulsants, anticholinergic, alpha-agonist, NDRI and etc

included eight different groups: cardiologists, general practitioners, neurologists, neurosurgeons, pediatricians, internists, psychiatrists, and surgeons. Using the criteria already mentioned, we evaluated unadjusted overalls and stratified trends in the prescriptions of psychotropic medications.

Results

The total number of prescriptions issued for all psychotropic medications reached 1,167,460 items. Our target population was 920,617 people who were covered by social security insurance, 44.9% (413,466 people) of whom received prescriptions for psychotropic medicines. 7246 different doctors prescribed psychotropic drugs. The average age of individuals receiving psychotropic drugs was 45.57 years. Gabapentin had the highest prescription rate, with 114,405 prescriptions, or 9.8% of the total prescriptions listed. Sertraline, with a total of 85,517 prescriptions, was the second most commonly prescribed medicine, accounting for 7.3% of all prescriptions. The research revealed significant prescription rates for nortriptyline, fluoxetine, and trifluoperazine, ranging from 6.8 to 6.7%. Other frequently prescribed psychotropic medications included alprazolam (5.2%), chlordiazepoxide (5.1%), and valproate (5.0%) (Table 1).

Antidepressants accounted for 444,364, or 38.1%, of all prescriptions, indicating frequent treatment of depressive disorders. At 217,154 prescriptions given, anxiolytics made up 18.6% of all psychotropic drugs. This

Table 2 Psychotropic medications categorical frequency and percentage

Type	Frequency	Percent
Antidepressant	444,364	38.1
Others	241,217	20.7
Anxiolytic	217,154	18.6
Antipsychotic	180,715	15.5
Mood stabilizer	70,452	6.0
Stimulants	13,558	1.2
Total	1,167,460	100.0

demonstrated the widespread use of anxiolytics in treating conditions associated with anxiety. The category of other psychotropic drugs, which included various medications that are not particularly classified, accounted for 241,217 prescriptions, making up 20.7% of the total. The number of antipsychotic prescriptions was 180,715, accounting for 15.5% of the overall prescriptions. These medications primarily treat psychotic disorders, such as schizophrenia. Mood stabilizers are frequently prescribed for mood disorders, including bipolar disorder, accounting for 6.0% of the total and 70,452 prescriptions. Stimulant drugs, accounting for 1.2% of all prescriptions, were primarily used to treat ADHD, with a total of 13,558 prescriptions (Table 2).

Based on their age ranges, we classified individuals into four distinct age groups: preadolescent and younger, adolescent, adult, and elderly. We discovered that adults of all age groups have the highest frequency of prescriptions

for psychotropic medications, implying a substantial preference for the widespread use of this particular type of medication (Fig. 1).

Of the total number of patients, 150,963 were male and utilized at least one psychiatric medication. The remaining 63.5% of the 262,503 patients were female. The prescription rates for both sexes exhibited comparable trends, typically reaching their highest point at approximately the age of 40. The quantity of prescribed medications showed a consistent increase, beginning at approximately the age of 20, reaching its peak at approximately the age of 40, and then progressively decreasing. At approximately 20 years of age, male patients' prescription behavior was significantly different from that of other population groups, as they did not experience a significant decrease in the number of prescriptions (Fig. 2).

Oral administration was the most prevalent form of prescribing medication, accounting for 93.7% of the total, which corresponded to 1,094,106 prescriptions. Injections were the second most common form of treatment, with 68,019 prescriptions, or 5.8% of the total. The dataset includes information about the number of psychotropic medicine prescriptions issued by physicians over specific time periods. We categorized physicians into six distinct groups based on the year of their graduation. These groups included those who graduated before 1979, individuals who completed their medical education in the late 1970s and 1980s, those who graduated during the 1980s and early 1990s, medical professionals who obtained their degrees in the late 1990s and early 2000s, those who graduated in the 2000s, and recent graduates spanning from 2017 to 2022. The group of physicians who completed their medical education between 1997 and 2007 exhibited the highest prevalence of prescribing psychotropic drugs (488,228). This specific group
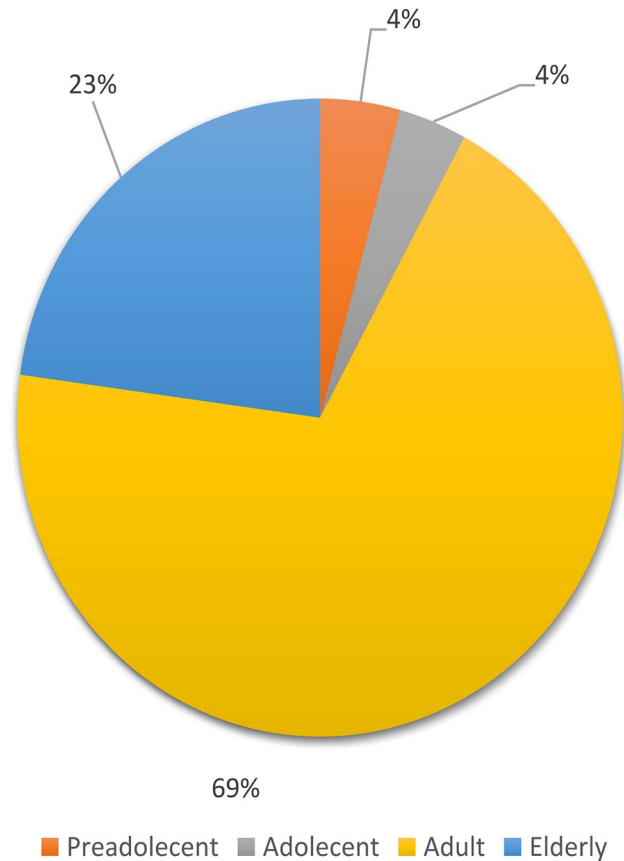

Fig. 1 The prescription distributions of different age groups

accounted for a substantial proportion, exactly 41.8%, of all the prescriptions encompassed in our dataset. Prior to 1979, physicians who had completed their medical training issued a total of 23,681 prescriptions for psychotropic drugs, constituting approximately 2% of all prescriptions dispensed. During the period from 1979 to 1987, a total
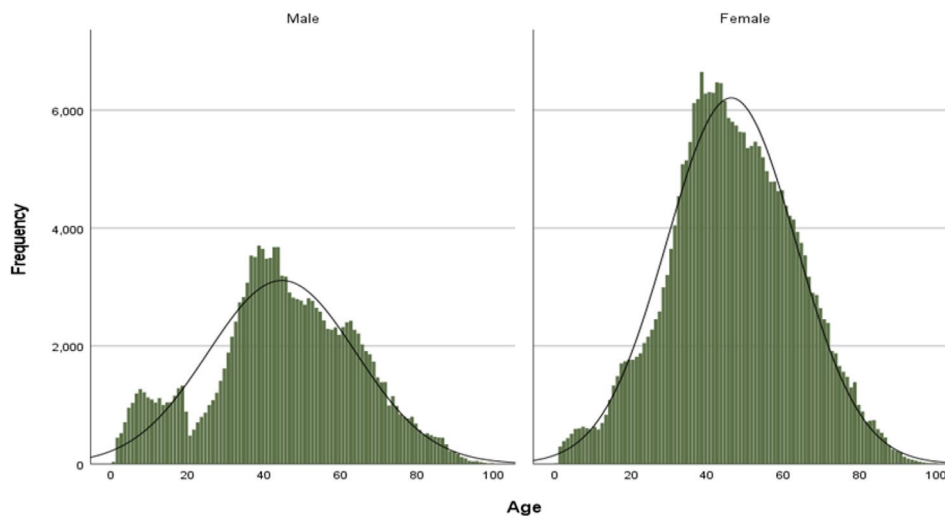

Fig. 2 Bar chart displaying the age and sex distributions of the prescriptions

of 93,710 individuals successfully completed their studies, accounting for 8% of the entire group. Physicians who graduated during that period issued a total of 295,035 prescriptions, accounting for 25.3% of the total. From 2007 to 2017, doctors who finished their medical school issued 190,157 prescriptions, which accounted for 16.3% of the total number of prescriptions. The number of prescriptions for physicians who graduated from 2017 to 2022 was 76,649, which made up 6.6% of the total. Those who completed their medical schooling between 1987 and 2007 issued the majority of the antidepressant prescriptions. The percentage of antipsychotic prescriptions remained fairly constant throughout different graduation dates, ranging from 11.1 to 15.7%. The proportion of prescriptions for anxiety medication among those who had recently finished their education increased significantly, reaching 29% between 2017 and 2022. The total prevalence of mood stabilizer prescriptions was quite low, ranging from 3.2 to 8% (Table 3).

General practitioners and cardiologists primarily prescribed antidepressants (31.6% by GPs, 45.1% by cardiologists) and anxiolytics (28.4% by GPs, 39.7% by cardiologists). In particular, psychiatrists and pediatricians administered antipsychotics (22.1% by psychiatrists, 27.4% by pediatricians) and antidepressants (40.8% by psychiatrists, 28.3% by pediatricians). Antidepressants made up a large percentage of the prescriptions given by neurologists and internal specialists (40% by neurologists, 49.7% by internists), as did drugs classified as "others" (26.3% by neurologists, 22.6% by internists). Approximately 50% of the medications were categorized as others, and 32% of the antidepressants were administered by surgeons (Fig. 3).

General practitioners had the highest number of instances of prescribing psychotropic drugs, with a total of 337,381 prescriptions. This represented approximately 28.9% of all prescriptions in their category. Within the healthcare system, psychiatrists had a major impact by contributing to a large number of prescriptions (301,242), which accounted for 25.8% of the total prescriptions in their category. Medical specialists, including surgeons, internal medicine specialists, and neurologists, had a profound impact on the administration of psychotropic drugs. Compared to other medical specialties, cardiologists and neurosurgeons had lower prescription rates. According to the survey, among the several specialists, pediatricians were the least prevalent (Table 4).

Discussion

The purpose of this research is to further expand the understanding of how medications are administered to an extensive spectrum of patients by analyzing the patterns of prescriptions for psychiatric medicines that are issued in outpatient settings. This study serves as a preliminary investigation, paving the way for more in-depth analyses aimed at identifying drug interactions, inappropriate prescriptions, and those prescriptions that may contribute to adverse health outcomes. The ultimate goal is to enhance patient care while also reducing medical expenses. Not only do cost-effective strategies improve patient outcomes, but they also guarantee the efficient utilization of healthcare resources. Healthcare providers can implement targeted interventions that promote improved health practices by identifying areas for improvement and understanding patterns in drug utilization. These interventions may encompass educational initiatives that

Table 3 The number of psychotropic medications prescribed by doctors with different graduation dates

|	-1979		1979–1987		1987–1997		1997–2007		2007–2017		2017–2022		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Antidepressant	9253	39.1	33,702	36.0	118,256	40.1	192,776	39.5	72,712	38.2	17,656	23.0	444,364	38.1
Antipsychotic	2630	11.1	12,097	12.9	46,244	15.7	74,073	15.2	24,495	12.9	21,176	27.6	180,715	15.5
Anxiolytic	6458	27.3	22,403	23.9	44,637	15.1	90,734	18.6	30,676	16.1	22,246	29.0	217,154	18.6
Mood stabilizer	1682	7.1	7543	8.0	20,518	7.0	27,742	5.7	10,545	5.5	2422	32.0	70,452	6.0
Others	3623	15.3	17,794	19.0	59,461	20.2	97,818	20.0	49,430	26.0	13,091	17.1	241,217	20.7
Stimulant	35	0.1	171	0.2	5910	2.0	5085	1.0	2299	1.2	58	0.1	13,558	1.2
Total	23,681	100.0	93,710	100.0	295,035	100.0	488,228	100.0	190,157	100.0	76,649	100.0	1,167,460	100.0
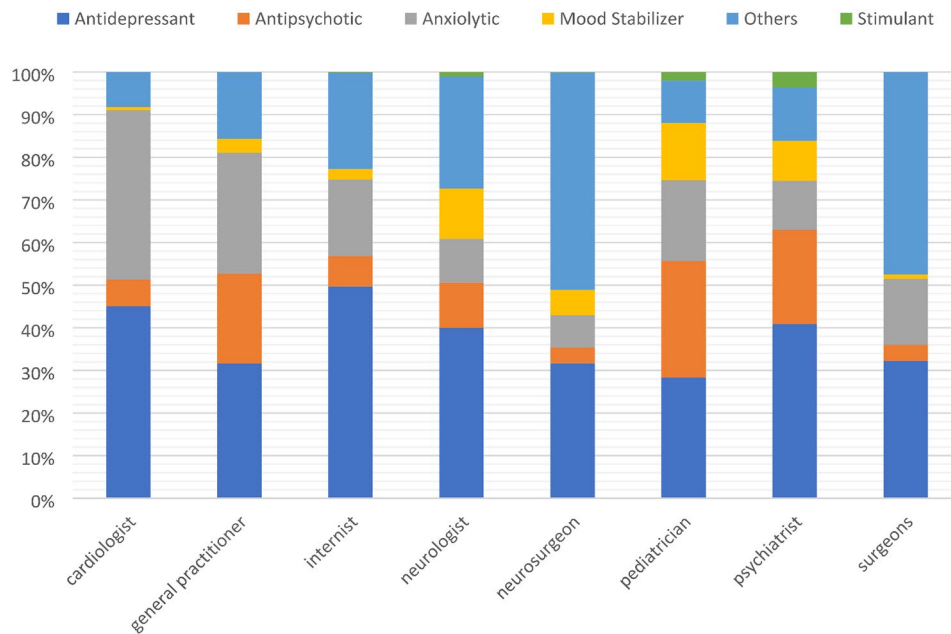
Fig. 3 The number of psychotropic medications prescribed by different specialties

Table 4 The number of psychotropic medications prescribed by different specialties

Specialty	Frequency	Percent
Pediatrician	19,193	1.6
Neurosurgeon	40,145	3.4
Cardiologist	56,781	4.9
Surgeons	94,423	8.1
Internist	135,061	11.6
Neurologist	183,234	15.7
Psychiatrist	301,242	25.8
GP	337,381	28.9
Total	1,167,460	100.0

are designed to raise awareness about the proper use of medications for both patients and providers.

In our study, the most commonly prescribed medicines were gabapentin, sertraline, nortriptyline, fluoxetine, and trifluoperazine. From 2002 to 2016, gabapentin prescriptions increased in the United States, with growth rates ranging from 44 to 179%. In 2016, the prevalence rates for distinct states ranged from 12.7 to 43.9 per 1,000 individuals between April 2015 and February 2020 [9], and the prescription rates for gabapentin and pregabalin in England consistently increased, with annual increases ranging from 1.5 to 11.9%. The prevalence of gabapentin prescriptions in our target group was as high as in countries such as the United States and the United Kingdom [10]. Adrian H. Heald et al. conducted a study in England and revealed that 52 million individuals received a total of 2.1 billion doses of antidepressants. This represents 11% of daily antidepressant users. SSRIs, specifically sertraline, were the most commonly used type of antidepressant medication in both populations. The most commonly prescribed antidepressants in the UK, other than those previously mentioned, were citalopram, fluoxetine, and mirtazapine. Certain older agents, such as trimipramine and doxepin, are prescribed at a significantly elevated cost. Our target population had been prescribed sertraline more frequently than any other antidepressant medicine. Fluoxetine exhibited a significant rate of prescription in both statistical populations. However, the prescription rate of nortriptyline in England was lower [11]. Louise Marston et al. conducted a study in England that showed that 47,724 patients were receiving antipsychotic medications. The difference between these two studies is that, in England, the prescription of second-generation antipsychotic medications was far greater than that of first-generation drugs [12]. A total of 13,941 people received first-generation medications, while 27,966 people received second-generation medications. Haloperidol, chlorpromazine, and trifluoperazine were the three most often prescribed first-generation antipsychotics. In our target population, trifluoperazine was the most often prescribed antipsychotic.

The lowest prescription rates were for tranylcypromine, thiothixene, desimipramine, and flurazepam. Due to the availability of safer and more modern alternatives, as well as the potential side effects of these medications, their use is infrequent.

Patients receiving psychotropic medications had an average age of 46 years. Villalobos-Madriz et al. conducted a study in Latin America and reported that the average age of the patients was 58 years [13], approximately 10 years older than the average age of our target

demographic group. We can attribute this phenomenon to heightened consciousness, diminished social disapproval, and the enhanced availability of mental healthcare services. Those in the middle age range could be more likely than younger individuals to actively seek medical attention and follow recommended treatments. Adults exhibit a greater propensity to actively seek medical assistance for mental health concerns in comparison to younger age groups [14].

Women received prescriptions for psychotropic medications twice as frequently as men did. Camila Stefani et al. conducted a study in Brazil from 2014 to 2015, and the results were similar to our findings. They found that the prevalence of prescribing psychotropic medicines to women was twice as high as that to men [15]. This could be attributed to disparities in our culture and biological differences that influence how women and men respond to the problems they face in their lives. Women are more likely to seek therapy and talk about mental health issues than men are; psychotropic drug prescriptions could increase. Women use healthcare services more than men do, which increases the likelihood of using psychotropic medications to diagnose and treat mental health conditions.

45% of our target population received prescriptions for psychotropic medicines, suggesting that the individuals in this category are dealing with mental health issues. An elevated prescription rate may indicate a decline in social disapproval and a heightened inclination among individuals to seek assistance for mental health concerns. This number highlights the significance of mental health as a critical area of concentration from a public health standpoint. It emphasizes the necessity of ongoing funding for mental health care, research, and education to uphold the welfare of the population. In research on the use of psychotropic drugs in 65 nations, Ruth Brauer et al. reported a notable increase. A high prescription rate indicates a high frequency of mental health issues, simple access to treatment, proactive diagnostic techniques, positive societal perceptions of mental health, and the perceived efficacy of psychotropic drugs. This means that addressing mental health needs and providing treatment are critical [16].

The prescription of psychotropic medicines in males exhibited two distinct age peaks at 18 and 40 years, whereas in females, there was only one age peak at 40. Lamiece Hassan et al.'s 2012–2013 research in England showed a positive correlation between age and the likelihood of receiving psychiatric medication prescriptions [17], which is in contrast to our findings. During the ages of 18 to 20, men encounter various pressures, including university entrance examinations, military service, and the transition into the job market. Upon moving past this developmental phase, many find a greater sense of stability. These factors may contribute to a decrease in the prevalence of psychotropic drug prescriptions. Men experiencing a second peak at approximately age 40 may be associated with pressures that often surface in midlife, such as demands at work, responsibilities to their families, financial difficulties, and health conditions that might exacerbate mental health issues. One peak in females at age 40 suggested that social relationships and mental health are particularly difficult for this particular age group. These difficulties include taking care of elderly parents, managing the demands of work and family, and experiencing premenopausal hormone changes.

Antidepressants were the most commonly given category of medication. The growing number of SSRI prescriptions in Irish general practice, which increased by 35.2% between 2015 and 2016 and 2021–2022 [18], demonstrates this tendency. The rise in public awareness and the decrease in social disapproval of mental health problems have likely played a role in the increased number of people seeking assistance and undergoing therapy. Moreover, the COVID-19 epidemic has intensified mental health problems on a global scale, resulting in a significant increase in the number of prescriptions for antidepressant medications [19]. Overall, the prevalence of antidepressant prescriptions compared to other psychiatric medicines is complex and emphasizes the significant occurrence of depressive illnesses, the effectiveness and safety of antidepressants, their expanding use, and the evolving societal attitudes and approaches to mental health problems. This trend highlights the importance of ongoing research and development in the field of psychopharmacology to meet the changing requirements of patients.

Stimulants were the least frequently prescribed category of drugs. In a study conducted by Danielson et al. in the United States, the proportion of individuals who registered for a program and obtained at least one prescription stimulant increased from 3.6% in 2016 to 4.1% in 2021 [20]. Policies implemented during the COVID-19 epidemic broadened the availability of prescription stimulants via telemedicine, which in turn led to an increase in prescription rates. Between 2020 and 2021, the proportion of women aged 15 and 44 years and men aged 25 and 44 years who obtained prescription stimulants increased by more than 10%. The data suggest a rise in adults' awareness of ADHD [21], with notable increases in the number of prescriptions given to adult females and boys. The prescription rate for central nervous system (CNS) stimulants and medications used to treat ADHD has risen by approximately 66% since 2015 [22]. The overall quantity of such prescriptions for the fiscal year 2021–22 was 2.13 million, representing a 16.4% increase compared to the previous year [23]. Adolescent men received the majority of prescriptions, with male patients between the

ages of 10 and 14 showing the highest frequency. In conclusion, both the United States and the United Kingdom have experienced significant increases in the prescription of stimulants, specifically for the treatment of attention deficit hyperactivity disorder (ADHD). We can attribute the low prevalence of stimulant prescriptions in our target society to societal non-acceptance of adult stimulant use. The trends emphasize the significance of identifying and controlling ADHD in both children and adults, as well as the influence of socioeconomic factors on prescription trends.

Most medical professionals primarily prescribe antidepressants [24], whereas surgeons primarily prescribe medications such as gabapentin and pregabalin. In particular, SSRIs and SNRIs, antidepressants, have a much better safety and effectiveness profile than more traditional psychiatric medications [25]. For many healthcare professionals, this quality makes them the best option. Surgeons commonly administer gabapentin and pregabalin as part of a multimodal pain management strategy to reduce reliance on opioids [26]. This approach helps mitigate the possible risks associated with the use of opioids, such as addiction and adverse side effects [10, 27]. Also, the visits to franchisee Iran, both in the private and public sectors, are very low (in the private sector for primary care physicians $2, for specialists $4, and in the public sector about $0.5). Consequently, various segments of society have convenient access to healthcare professionals. The regulations governing the Iranian health system permit medical doctors, irrespective of their specialty, to prescribe a variety of psychotropic medications, as long as such prescriptions do not pose a risk to patients. Thirty years ago, in response to the shortage of psychiatrists and the significant prevalence of depressive and anxiety disorders, continuing education programs were established at the primary care level to address and effectively manage these conditions. For this reason, doctors prescribe various drugs, including antidepressants, in addition to those related to their specialty. Given the potential interactions and side effects of these drugs, it is necessary to develop educational programs to raise awareness among doctors and medical students.

In addition to any other group, psychiatrists prescribed antidepressants and antipsychotics. Leading prescribers of psychotropic medications, such as antidepressants and antipsychotics, have extensive training and expertise in mental health [28]. Psychiatrists are trained to evaluate each patient's specific needs and modify treatment strategies as necessary. This may involve the use of antidepressants for mood disorders and antipsychotics for illnesses such as schizophrenia and bipolar disorder. Clinical guidelines and evidence-based practices commonly urge the use of antidepressants and antipsychotics as first-line therapies for specific mental health problems

[29]. Psychotropic drugs, particularly antipsychotics, require close monitoring due to potential side effects and the need for dosage modifications. Psychiatrists see more severe and complicated mental health conditions than other medical professionals. Like our research, Abdolreza Sabahi et al. reported a significant incidence of psychiatrists prescribing antidepressants in Kerman Province, Iran [30]. A 2009 study in America revealed a higher administration rate of benzodiazepines. The disparity may stem from our intended audience's limited knowledge about sleep disorders [31]. Ultimately, the increased use of antidepressants and antipsychotics by psychiatrists is due to their expertise in mental health [28], the prevalence and complexity of mental health disorders, their adherence to established clinical protocols, and the need for meticulous supervision and control of these medications.

Limitations

The limitation we encountered in this study was the fact that despite the extensive searches of similar studies and articles, we could not find congruent results for some of the facts we found in our study. Moreover, the gathered data were raw, and we were unable to calculate the proportion of prescriptions to doctors who prescribed those medications. Additionally, the data collected did not contain the diagnoses of the patients, which prevented us from assessing the prescriptions in accordance with the final diagnosis.

Conclusion

Approximately 45% of our targeted demographic participants were prescribed psychotropic drugs, highlighting the significant relevance of mental health in our target population. Antidepressants are the most commonly prescribed class of drugs, highlighting the importance of conducting further studies in this area to uncover particular information on the incidence of depression and its impact on individuals. Nearly every medical specialty studied prescribed the administration of antidepressants, indicating the need for training programs to thoroughly educate healthcare professionals and medical students on the potential negative effects and proper dosage of these medications. Stimulants were prescribed less frequently in comparison to other studies conducted in developed countries. We could attribute this to the stigma in our society associated with adults taking these medications. It emphasizes the importance of educational programs and information dissemination, which regulators should take into account. Almost one out of every two patients in our study received psychotropic medications. A conflict of interests is presented as a result of the fact that the total duration of a psychiatric ward in a medical course is only two months. This underscores the necessity of

Farahbakhsh *et al. BMC Psychiatry*   (2025) 25:10

Page 9 of 10

considering an extension of the psychiatric course in medical training programs. Ultimately, this study aimed to shed light on mental health concerns and prescription patterns that have been overlooked in Iran and to assist the government and healthcare professionals in delivering accessible and appropriate services to the population.

Abbreviations

ADHD	Attention-Deficit/Hyperactivity Disorder
SSO	Social Security Organization
MAOI	Monoamine Oxidase Inhibitor
SSRI	Selective Serotonin Reuptake Inhibitor
SNRI	Serotonin-Norepinephrine Reuptake Inhibitor
TCA	Tricyclic Antidepressant
TeCA	Tetracyclic Antidepressant
SARI	Serotonin Antagonist and Reuptake Inhibitor
NDRI	Norepinephrine Dopamine Reuptake Inhibitor
GP	General Practitioner
CNS	Central Nervous System

Author contributions
All authors contributed to the study conception and design. Material preparation and data collection was were performed by E.A and A.A. Data analysis was performed by E.A and M.F. The first draft of the manuscript was written by A.F and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Data availability
The data that support the findings of this study are available from the Social Security Organization (Tamin Ejtemaei), but restrictions apply to the availability of these data, which were used under license for the current study and are not publicly available. The data are, however, available from the authors upon reasonable request and with the permission of the Social Security Organization (Tamin Ejtemaei). Kindly reach out to the corresponding author, as indicated on the initial page, to obtain access to the data.

Declarations

Ethics approval and consent to participate
The ethics review board of Tabriz University of Medical Science endorsed the investigation with the ethical code IR.TBZMED.REC.1402.284. The ethics review board had the discretion to waive the requirement for human participant consent in this database study, as it was anonymous and retrospective in nature. In compliance with social security insurance legislation, the insured's medical information may be employed in research studies. The procedures employed in this investigation were consistent with the principles of the Declaration of Helsinki. https://ethics.research.ac.ir/IR.TBZMED.REC.1402.284 is the address of the online version of the statement, which is accessible to the public.

Consent for publication
Not applicable.

Statement
Despite the fact that authors made use of advanced large language models (LLMs) like ChatGPT, Copilot (Bing AI) and writing platform (Quillbot) to help assess linguistic quality and assist in utilization of data analysis software such as Excel and SPSS, it was ultimately the authors who conducted the analysis and interpretation of the results.

Competing interests
The authors declare no competing interests.

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