

Patterns of Psychotropic Medication Prescriptions by Psychiatrists for Private Clinic Outpatients in Kerman Province, Iran

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أنماط وصفات الأدوية التي يصفها الأطباء النفسيون في العيادات الخارجية الخاصة في محافظة كرمان بإيران

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ABSTRACT: Objectives: The aim of this study was to assess the pattern and utilisation of psychotropic drug prescriptions by psychiatrists in Kerman Province, Iran. **Methods:** The prescriptions of 27 psychiatrists were randomly selected from two Iranian public insurance organisations and were analysed for the mean number of drugs/prescriptions, drug category and the most frequently prescribed drug in each category as well as overall. **Results:** A total of 6,414 prescriptions were analysed. The mean number of drugs per prescription was 2.9. Antidepressants (61.0%) were the most frequently prescribed category of psychotropic medications, followed by antipsychotics (29.5%), sedative/hypnotics or anti-anxiety drugs (27.5%) and mood stabilisers (18.5%). The combination of antidepressants with antipsychotics was the most commonly prescribed combination (18.8%). Fluoxetine (16.5%) and trifluoperazine (13.5%) were among the most frequently prescribed antidepressants and antipsychotics, respectively. Clonazepam (10.5%) was the most commonly prescribed benzodiazepine agent, followed by alprazolam (8.5%). In terms of total drug utilisation, sertraline (12.4%) was the most commonly used psychotropic medication followed by fluoxetine (9.7%), trifluoperazine (6.6%), propranolol (4.5%) and clonazepam (3.7%). **Conclusion:** A high proportion of psychotropic prescriptions in Kerman Province were for antidepressants, followed by antipsychotics and the benzodiazepines. Further research is needed to determine the underlying correlation between prescription practice and the diagnosis and patient characteristics, as well as to investigate the use of different psychotropic medications.

Keywords: Prescriptions, trends; Prescriptions, utilization; Psychotropic Drugs; Psychiatrists; Iran.

المخلص: الهدف: تهدف هذه الدراسة لتقييم أنماط وصفات الأدوية التي يصفها الأطباء النفسيون في عيادات الطب النفسي الخارجية الخاصة في محافظة كرمان بإيران. **الطرق:** أختيرت عشوائياً وصفات 27 طبيباً نفسياً في محافظة كرمان من منظمتين إيرانيتين للتأمين العام، وتم تحليلها للحصول على متوسط عدد الأدوية وتصنيف الأدوية الموصوفة، وأكثر الأدوية التي تم وصفها في كل صنف. **النتائج:** تم تحليل 6,414 وصفة، وكان متوسط عدد الأدوية في كل وصفة هو 2.9 دواء. ووجد من دراسة نماذج الأدوية الموصوفة أن 61.0% من تلك الأدوية كانت من مضادات الاكتئاب، تلتها مضادات الذهان (بنسبة 29.5%) ثم المهدئات/المنومات/مضادات القلق (بنسبة 27.5%) ثم مثبتات المزاج (18.5%). وكانت أكثر الأدوية التي أعطيت مع مضادات الاكتئاب مع مضادات القلق (بنسبة 18.8%)، حيث أعطي مضاد الاكتئاب فلوكسيتين (بنسبة 16.5%) مع مضاد الذهان تراي فلو بيرازين (بنسبة 13.5%). وكان أكثر الأدوية التي وصفت في مجموعة البنزودايروبين هو كلونازيبام (بنسبة 10.5%)، تليه البرازولام (بنسبة 8.5%). وبالنسبة إلى كل أصناف الأدوية كان سيرتالين هو أكثر دواء تم وصفه (بنسبة 12.4%) وتلاه فلوكستين (بنسبة 9.7%) ثم برانالول (بنسبة 4.5%) وكلونازيبام (بنسبة 3.7%) ثم تراي فلو بيرازين (بنسبة 6.6%). الخلاصة: كانت أعلى نسب وصفات الأدوية النفسية في محافظة كرمان بإيران هي لمضادات الاكتئاب وتلاها مضادات الذهان ومجموعة بينزي دايروبين. ويجب في الدراسات القادمة تحديد العلاقة الكامنة بين ممارسة كتابات الوصفات الطبية والتشخيص وخصائص المريض، ودراسة استخدام مختلف الأدوية المستخدمة في الطب النفسي.

مفتاح الكلمات: وصفات طبية؛ توجهات؛ استخدام الأدوية؛ الأدوية النفسية؛ الأطباء النفسيون؛ إيران.

ADVANCES IN KNOWLEDGE

- Antidepressant drugs are the group of psychotropic drugs most frequently prescribed by psychiatrists in Kerman Province, Iran, followed by antipsychotics and sedative/hypnotics.
- Fluoxetine, sertraline, propranolol and clonazepam are among the most frequently prescribed psychotropic drugs by this group of psychiatrists.

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APPLICATION TO PATIENT CARE

- The high rate of antidepressant prescriptions found in this study is of special importance. Further research should be carried out to determine whether these drugs are prescribed for outpatients with depression or if they are used to treat patients with diagnoses other than depressive disorders.
- In addition, it is recommended that health organisations investigate the reasons for the high rate of psychotropic prescriptions in Kerman Province and implement interventional programmes to improve the rational prescription of these medications through standardised treatment guidelines.

AN INCREASING TREND IN THE PRESCRIPTION of psychotropic medications by physicians has been noted in recent years and the increase in psychotropic prescriptions by psychiatrists and general practitioners (GPs) has been reported in both developing and developed countries.¹⁻⁴ Psychotropic medications are often prescribed for non-psychotic disorders, such as eating disorders in children, adolescents and adults.⁵ There is also an increased prevalence of antipsychotic drug use among children and adolescents, as well as an increasing trend in the abuse of central nervous system (CNS) stimulants among young adolescents, including amphetamines, methylphenidate and ecstasy. This has been observed in many countries, including Iran.⁶⁻⁹ There is a significant difference in the rate of prescription and consumption of sedative/hypnotic drugs and antidepressants between developed and developing countries. Anti-anxiety drugs were the most frequently prescribed psychotropic drugs in various psychiatric disorders followed by antipsychotic drugs and antidepressant drugs in outpatients (OPD) of a psychiatry department in India;¹⁰ however, stimulants and antidepressants consistently ranked first and second in psychotropic medication treatment for youths in USA.¹¹

Only a few studies have examined prescribing practices among physicians in Kerman Province, Iran. One study reported prescription practices among GPs, reported that sedative/hypnotic drugs were prescribed for 19.56% of patients visited by GPs.¹² Another study among residents living in Bam, a city in Iran, observed that drugs affecting the CNS were the most frequently prescribed, representing 52.7% of all prescribed drugs.¹³

To date there has been no reliable information on the prescribing habits of psychiatrists in Iran; thus, this study aimed to assess the pattern of drug prescription and utilisation of psychotropic medications in outpatients visited by psychiatrists at private clinics in Kerman Province, Iran.

Methods

This retrospective cross-sectional study was conducted over a one-year period between 1st

May 2012 and 1st May 2013. The prescriptions of 27 psychiatrists were randomly selected from two Iranian public insurance organisations in Kerman Province. The Iranian Social Security Organization (SSO) provides legally compulsory insurance coverage to workers and employees in the private sector. Self-employed individuals can also elect to belong to the SSO (n = 4,391). The Iranian Medical Services Insurance Organization (MSIO) covers a wide range of individuals in the community, including government employees and individuals of various socioeconomic levels who are not eligible to be covered by other insurance organisations (n = 2,023). A total of 6,414 prescriptions were randomly selected from these two public insurance companies and analysed, with at least 100 prescriptions per psychiatrist.

Prescriptions that had been issued to patients of all ages and both genders and which contained at least one psychotropic medication were included in the study. Drug-related information (including the drug names, dose, dosage form and route of administration) were recorded on a customised data collection sheet. Anaesthetics, antiepileptic medications and drugs used in the management of Parkinsonism were excluded from the study.

The data were also analysed using three World Health Organization (WHO) indicators to determine drug use in a health facility: the average number of drugs per encounter, the percentage of drugs prescribed under a generic name and the percentage of injections prescribed per encounter.¹⁴ The drug categories and the most frequently prescribed drugs

Table 1: Drug use indicators for psychiatrist-prescribed psychotropic prescriptions for outpatients in Kerman Province, Iran*

Indicators	n	%
Average number of drugs per prescription	2.9	-
Number of drugs prescribed by generic name	5,452	85
Prescriptions with complete documentation [†]	6,029	94
Number of drug injections prescribed	257	4

*Using the World Health Organization indicators to determine drug use in a health facility.¹⁴ [†]Including complete drug name, dose, dosage form and route of administration.

Table 2: Prescription patterns of the most common psychiatrist-prescribed psychotropic drugs by selected drug categories for outpatients in Kerman Province, Iran

Drug category	Prescription rate n (%) [*]	Total drug utilisation %
Antidepressants	3,912 (61.0)	38.2
Fluoxetine	1,058 (16.5)	9.7
Sertraline	962 (15.0)	12.4
Citalopram	417 (6.5)	3.2
Others	1,475 (23.0)	12.9
Antipsychotics	1,892 (29.5)	17.5
Trifluoperazine	866 (13.5)	6.6
Quetiapine	289 (4.5)	2.4
Olanzapine	192 (3.0)	1.6
Others	545 (8.5)	6.9
Sedative/hypnotics	1,764 (27.5)	17.5
Clonazepam	674 (10.5)	3.7
Alprazolam	545 (8.5)	3.2
Chlordiazepoxide	224 (3.5)	2.8
Others	321 (5.0)	7.8
Mood stabilisers	1,187 (18.5)	8.6
Lithium	789 (12.3)	6.0
Sodium valproate	308 (4.8)	2.1
Carbamazepine	90 (1.4)	0.5
Stimulants	481 (7.5)	4.8
Methylphenidate	481 (7.5)	4.8
Other CNS drugs	923 (14.4)	11.4

CNS = central nervous system. ^{*}More than one drug may have been prescribed per patient.

in each category were also recorded. Drug utilisation was measured by taking the total defined daily doses for each drug or drug category and dividing this by the total defined daily doses of all psychotropic medications.

The psychotropic drugs were classified into six therapeutic drug classes: antipsychotics, antidepressants; sedative/hypnotics (anti-anxiety); CNS stimulants; mood stabilisers (lithium, sodium valproate or carbamazepine) and others (beta blockers, antihistamines, anticholinergic agents, etc.).

The data were processed and presented using the Statistical Package for the Social Sciences (SPSS), Version 13 (IBM, Corp., Chicago, Illinois, USA). The Mann-Whitney U nonparametric test was used to compare the differences between the utilisation of

Table 3: Utilisation patterns of the most common psychiatrist-prescribed psychotropic drugs for outpatients in Kerman Province, Iran

Drug (dosage form)	Prescription rate %	Total drug utilisation %	Dose in mg
Fluoxetine (C)	16.5	9.7	10
Sertraline (T)	15.0	12.4	50
Trifluoperazine (ScT)	13.5	3.6	1
Propranolol (FcT)	11.5	4.5	10
Clonazepam (ST)	10.5	3.7	2
Alprazolam (ST)	8.5	1.4	0.5
Citalopram (T)	6.5	3.1	30
Quetiapine (T)	4.5	1.3	100
Chlordiazepoxide (ST)	3.5	0.9	5
Olanzapine (T)	3.0	0.6	5

C = capsule; T = tablet; ScT = sugar-coated tablet; FcT = film-coated tablet; ST = scored tablet.

each drug group. Approval to use the data was granted by both the SSO and the MSIO.

Results

A total of 6,414 psychiatric outpatient prescriptions were analysed using the WHO indicators to determine drug use in a health facility.¹⁴ Overall, the mean number of drugs per prescription was 2.9 (range: 1–12). The majority of prescriptions (94%) had complete documentation regarding the drug information. Most of the drugs (85%) were prescribed by a generic name. Injectable drugs were prescribed in 4% of the prescriptions (range: 1–15%) [Table 1].

A total of 52 different drugs were prescribed to outpatients of which 32 drugs were from the psychotropic category. The most frequently prescribed psychotropic medications were antidepressants (61.0%), followed by antipsychotics (29.5%), sedative/hypnotic/anti-anxiety drugs (27.5%) and mood stabilisers (18.5%) [Table 2].

In the antidepressant drug category, fluoxetine (16.5%) was the most commonly prescribed antidepressant, followed by sertraline (15.0%). Trifluoperazine (13.5%) was the preferred drug within the antipsychotics group, followed by quetiapine (4.5%). Clonazepam (10.5%) was the most commonly prescribed benzodiazepine agent among the sedative/hypnotics category, followed by alprazolam (8.5%). Among the mood stabilisers, lithium (12.3%) was preferred over sodium valproate (4.8%) and

Table 4: Psychiatrist-prescribed psychotropic drug category combinations for outpatients in Kerman Province, Iran

Drug category combination	Prescription rate n (%)
Antidepressants and antipsychotics	1,206 (18.8)
Antidepressants, antipsychotics and sedative/hypnotics	808 (12.6)
Antidepressants, antipsychotics, sedative/hypnotics and mood stabilisers	353 (5.5)
Other combinations	1,379 (21.5)

carbamazepine (1.4%). Methylphenidate was the most commonly prescribed stimulant (7.5%) [Table 2].

Utilisation patterns of the most commonly prescribed drugs were measured by taking the total defined daily doses for each drug or drug category and dividing this by the total defined daily doses of all psychotropic medications. In terms of total drug utilisation, antidepressants were the most commonly prescribed psychotropic medications (38.2%), followed by antipsychotics (17.5%) and sedative/hypnotics (17.5%). In all drug categories, sertraline (12.4%) was the most commonly used psychotropic medication followed by fluoxetine (9.7%), propranolol (4.5%) and clonazepam (3.7%) [Table 3]. The results of the current study showed that drug utilisation patterns in Kerman Province are in accordance with the prescription pattern.

Table 4 shows the types of psychotropic drug combinations prescribed to outpatients by the psychiatrists. Antidepressants and antipsychotics were the most commonly prescribed combination (18.8%), followed by the triple combination of antidepressants, antipsychotics and sedative/hypnotics (12.6%).

Discussion

Since the prescription pattern of Iranian psychiatrists has not been reported previously, to the best of the authors' knowledge, this study is a preliminary report for psychotropic medications in Iran. On average, a mean of 2.9 drugs were prescribed to outpatients per prescription. This is significantly higher than reported in similar studies in both developing and developed countries, such as Thailand and the USA, respectively.^{3,15} However, the findings of this study are comparable with a similar report from India.¹⁶ The majority of drugs were prescribed by their generic names. The rate of prescriptions that were accompanied by complete documentation and the percentage of injectable drugs prescribed were

comparable to a similar study by Udomratn *et al.*¹⁷

The results of this study showed that psychiatrists prescribed antidepressants most frequently. The psychiatrists' antidepressant prescription rate was significantly higher than the reported values for a similar study (23.1–48.6%).¹⁸ Antidepressants paired with antipsychotics were the most commonly prescribed combination (18.8%), which is comparable to findings from the study by Udomratn *et al.*¹⁷ In the USA, Goodwin *et al.* reported that stimulants were the most commonly prescribed drug category, followed by antidepressants, anxiolytics, antipsychotics and mood stabilisers.¹⁹ Psychotropic medication consumption patterns in a study of the general population in the UK was dominated by hypnotics, antidepressants and anxiolytics.²⁰

The reasons behind this high rate of antidepressant prescription are of special importance; the diagnosis by which antidepressant drugs are prescribed should be clarified. Specifically, it is important to know whether antidepressant drugs are prescribed for depression or for patients with diagnoses other than depressive disorders, such as anxiety disorders, eating disorders, enuresis, urinary stress incontinence or personality disorders.^{10,21} The high rate of antidepressant prescriptions found in the current study suggests a need for continued investigation and a systematic analysis of the specific disorders that are being treated with antidepressants. An increase in psychotropic and antidepressant prescriptions and their utilisation has been reported from other parts of the world as well.^{11,22} von Soest *et al.* reported a relationship between socioeconomic status and antidepressant prescriptions.²³

The results of the present study showed that the most frequently prescribed antidepressants in Kerman Province were fluoxetine and sertraline, which accounted for 57% of all prescriptions; this finding is comparable to some previous studies in which selective serotonin reuptake inhibitors (SSRIs) were the preferred prescribed antidepressant class of drugs.^{24,25} Fluoxetine, paroxetine and sertraline were the most frequently prescribed antidepressants in a Spanish study, accounting for 58% of all prescriptions in depressed patients.²⁴ The tolerability and efficacy of SSRIs in comparison with tricyclic antidepressants (TCAs) is controversial; however, some investigators have reported that SSRIs show an advantage in terms of tolerability in contrast to most TCAs.^{25,26}

The current study's results showed that antipsychotics were the second most frequently prescribed drug category by psychiatrists, which is not comparable to the results of similar studies in other parts of the world.^{19,20} Goodwin *et al.* reported

that stimulants were the most commonly prescribed psychotropic medications to youths in office-based practice in the USA followed by antidepressants, anxiolytics, antipsychotics and mood stabilisers;¹⁹ however, hypnotics were the most commonly prescribed psychotropic medications in the UK general population followed by antidepressants and anxiolytics.²⁰ In an Indian outpatient setting, antipsychotics were the second most commonly prescribed psychotropic drugs.¹⁰ A marked variation in antipsychotic and sedative/hypnotic prescriptions by psychiatrists and an increase in typical and atypical antipsychotic drug use has been reported in both developed and developing countries.^{7,27} These variations could be due to economic and social factors, drug availability, knowledge of adverse drug reactions and differences in morbidity.²²

In the present study, trifluoperazine was the preferred antipsychotic followed by quetiapine and olanzapine. The results were comparable to those of Xiang *et al.*, who found that quetiapine and olanzapine, second-generation antipsychotics, were the drugs most commonly prescribed to treat older schizophrenic patients in Asia between 2001–2009.²⁸

The results of the present study showed that 27.5% of patients were prescribed a benzodiazepine agent, which is higher than rates reported in some developing and developed countries.^{29,30} However, a higher benzodiazepine prescription rate (82.83%) by psychiatrists was reported in a study of outpatients in India.¹⁶ Benzodiazepines are efficacious for a wide range of conditions such as anxiety, insomnia, tonic-clonic seizures and muscular spasms; however, their rational use requires an understanding of the variable differences in potency, efficacy and duration of action between different benzodiazepines.³¹

In the current study, lithium was the preferred mood stabiliser and was prescribed over sodium valproate and carbamazepine—this finding is in harmony with another study from Asia.³² However, other researchers have reported that sodium valproate was the most frequently prescribed drug for manic-depressive patients.³³ The appropriateness of prescribing psychotropic medications as mood stabilisers needs further research.

Methylphenidate was the only psychiatrist-prescribed stimulant for the treatment of attention deficit disorder in children, which is comparable to the reports of other investigators.^{34,35} However, the rate of methylphenidate misuse or abuse was not determined in the current study and requires further investigation.

Fluoxetine, sertraline, trifluoperazine and clonazepam were among the most commonly prescribed psychotropic medications, which is

in agreement with a previous report.²⁴ However, propranolol was also among the most frequently prescribed drugs, which is one of the noteworthy findings of this study. Propranolol is mainly prescribed by psychiatrists to relieve the somatic manifestations of general and performance anxiety.

The reasons underlying the overall high rate of psychotropic medication prescription found in this study should be investigated. It is hoped that this type of research may provide a greater understanding of the prescribing patterns observed in the current study.

The study has several limitations which should be clarified. This survey is the result of the prescription patterns of 27 psychiatrists in Kerman Province in Iran; this population does not represent all psychiatrists throughout Iran (approximately 400). In addition, the information recorded on the prescriptions analysed did not include the patient's age, main diagnosis or socioeconomic status; these are significant factors affecting prescription patterns.²³ A larger survey is recommended to evaluate Iranian psychiatrists' psychotropic medication prescription patterns with an emphasis on the relationship between prescription pattern and patient diagnosis.

Conclusion

In summary, this is the first study to investigate prescription practices among psychiatrists in Iran. The results showed that the most common prescriptions were for antidepressants, followed by antipsychotics and benzodiazepines (sedative/hypnotics). The high rate of antidepressant prescriptions is of special importance. Future studies are recommended to investigate whether antidepressant drugs are prescribed solely for depressive disorders or if they are used to treat patients with other diagnoses. Further research is also needed to investigate a possible link between prescription practices, diagnoses, patient characteristics and the prescription of different antidepressants.

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