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Research Article

Drug Utilization Pattern of Psychotropic Drugs Prescribed in a Psychiatry Outpatient Department of a Tertiary Care Hospital

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Abstract
Background: Psychiatric disorders are one of the major causes of morbidity. Although psychotropic drugs have made a remarkable impact on outcome of psychiatric disorders, their utilization in actual clinical practice needs continuous monitoring. The World Health Organization (WHO) has prescribed drug use indicators for evaluating rational prescribing.
Aim: This study was undertaken at a tertiary care centre in western India to study the utilization pattern of psychotropic drugs.
Methods: After approval from the ethics committee, an observational, cross-sectional study involving 400 patients was done. The drug utilization pattern of psychotropics based on WHO prescribing drug use indicators was analysed using descriptive statistics.
Results: In 400 prescriptions, a total of 894 psychotropic drugs were prescribed. The average number of psychotropic drugs per prescription was 2.2 ± 1.03. 93.51% of the psychotropic drugs were prescribed by generic name. The utilization of psychotropic drugs from the National List of Essential Medicines (NLEM), India 2015 was 69.13%. Only 0.44% of the prescriptions contained psychotropic injectable drugs. Only 0.44% of the prescriptions contained psychotropic fixed dose combinations. In our drug utilization study, escitalopram among the antidepressants, olanzapine among antipsychotics, sodium valproate among mood stabilizers, lorazepam among sedative hypnotic drugs, and propranolol among miscellaneous psychotropics—were the most frequently prescribed drugs.
Conclusions: In our study, newer drugs were being prescribed more frequently due to their better safety and tolerability profiles. In view of changing therapeutic modalities in psychiatric diseases, regular monitoring of prescription pattern will contribute towards rational pharmacotherapy.

Keywords: Escitalopram, WHO drug use indicators, Olanzapine, Mood stabilizers, Prescription pattern.

INTRODUCTION

According to the World Health Organization (WHO), mental and substance use disorders rank among the most significant contributors to the global burden of disease. Mental, neurological, and substance use disorders make up 10% of the global burden of disease and 30% of the non-fatal disease burden.[1] Depression, alcohol use disorders, schizophrenia and bipolar disorders constitute the top 10 conditions contributing to the global burden of disease among the age group of 15-44 years.[2] A study conducted across the states of India reported that 197.3 million people had mental disorders in India in the year 2017, comprising 14.3% of the total population of the country. One in seven Indians was affected by mental disorders of varying severity in 2017.[3] A recent study published in 2019 by the Indian Psychiatric Society shows a twenty percent increase in mental illnesses since the coronavirus outbreak in India.[4] Treatment of psychiatric disorders is an important public health priority. Mental illness is associated with high levels of health service utilization. The field of psychopharmacology is changing rapidly, challenging the traditional concepts in the research and treatment of psychiatric disorders. This rapid growth exposes psychiatrists continuously to the number of new drugs that claim to be safer and more

efficacious.[5] Newer drugs are known to be expensive and unaffordable to most patients, especially in developing countries. Although psychotropic drugs have had a significant impact in psychiatry, their utilization in actual clinical practice, effectiveness and safety in real-life situations requires continuous monitoring.[6] WHO defines drug utilization study as "the marketing, distribution, prescription and use of drugs in society, with special emphasis on the resulting medical, social and economic consequences." These studies aim to encourage the rational use of drugs in the population. In the early nineties, the WHO collaborated with the International Network for Rational Use of Drugs (INRUD) to develop a set of "core drug use indicators".[7] The indicators of prescribing practices measure the performance of healthcare providers in several key dimensions related to appropriate use of drugs. It's critical to understand that improper drug use can put patients at potential risk and incur unneeded costs. Drug utilization studies include prescribing pattern studies as a vital component. They promote appropriate use of monitored drugs and discourage abuse or misuse of monitored drugs.

In recent years, psychiatric practice has seen a notable shift in the prescribing patterns of psychotropic medications. This change is largely driven by the introduction of newer drugs and the expansion of their approved uses. However, there is a scarcity of data regarding the usage patterns of psychotropic drugs, especially within the Indian healthcare context. Gaining insight into how these medications are prescribed and used in the general population requires analysis through prescription-based studies. Therefore, this study aimed to examine the prescribing trends of psychotropic drugs using the WHO drug use indicators in a psychiatry department of a tertiary care hospital.

METHODS

Study design and Approval

This study was a cross-sectional, observational study conducted at the psychiatric outpatient department of a tertiary care teaching hospital. After the approval from the ethics committee with reference number – ECARP/2021/16, the data was collected after taking written informed consent from the patients or guardians of patients before they were included in the study.

Inclusion and Exclusion Criteria

Patients of either gender, above the age of 18 years who were diagnosed with a psychiatric disorder & were prescribed at least one psychotropic drug were included whereas patients/guardians of patients who were not willing to participate or patients whose psychiatric diagnosis was not certain were excluded from the study.

Sample Size Calculation

Sample size was calculated based on the patient load of psychiatric cases in the psychiatric outpatient department. To represent the 12-month patient population of 25920, a sample size is calculated using a 95% confidence level and a 5% confidence interval as per the sample size calculator [8] which comes to be 379, which is rounded to 400.

METHODOLOGY

The data was collected from the OPD prescription letters of patients visiting Psychiatry OPD from July 2021 to June 2022 and was recorded in a case record form (CRF) by personal interview with patients or patient's guardian and from prescription letters handed over to the patients. The diagnosis and International Classification of diseases-10 (ICD-10) classification was confirmed from the psychiatrist.

Demographic details (age, gender) and necessary clinical data (presenting complaints, diagnosis, comorbidity) were noted. Study parameters were WHO prescribing drug use indicators such as average number of drugs prescribed per prescription, percentage of drugs prescribed under generic or brand name, percentage of drugs from the National List of Essential Medicines (NLEM) India 2015, percentage of injectable drugs prescribed, and percentage of antibiotics prescribed. Other parameters assessed were percentage of fixed dose combinations (FDCs) prescribed and the most frequently prescribed drug according to different groups of psychotropic drugs expressed in numbers and percentages.

Statistical Analysis

Descriptive analysis was carried out using mean and standard deviation with range for continuous variables and frequency and percentages for ordinal or nominal variables. Analysis was performed using Microsoft Excel 2019.

RESULTS

Demographic Data Analysis

Of the 400 cases analyzed, 55% were male and 45% female. The highest proportion of participants (25.5%) were aged 40–49 years, followed by 23.5% aged 30–39, 21% aged 18–29, 20.5% aged 50–59, and 9.5% aged over 60 years.

Clinical Data Analysis

The distribution of study participants by ICD-10 diagnosis is presented in Table 1. The majority (30.75%) were diagnosed with Recurrent Depressive Disorder, followed by Schizophrenia. Less common diagnoses, such as schizoaffective disorder (1.25%), Psychosis (1.00%), Alcohol Withdrawal Syndrome (0.75%), Tobacco Dependence Syndrome (0.50%), Conversion Disorder (0.50%), and Paranoid Personality Disorder (0.25%), were grouped under "Other psychiatric disorders."

Table 1: Distribution of Study Participants as Per Their ICD-10* Diagnosis

Disorder	ICD-10* Code	Frequency (n)	Percentage (%)
Recurrent Depressive Disorder	F.33	123	30.75%
Schizophrenia	F.20	90	22.50%
Mixed Anxiety & Depressive Disorder	F41.2	61	15.25%
Bipolar Affective Disorders	F.31	41	10.25%
Generalized Anxiety Disorder	F.41.1	21	5.25%
Obsessive Compulsive Disorder	F.42	16	4.00%
Panic Disorder	F41.0	9	2.25%
Somatoform Disorder	F.45	8	2.00%
Alcohol Dependence Syndrome	F.10	7	1.75%
Cannabis Dependence Syndrome	F.12.2	7	1.75%
Others		17	4.25%
Total		**400**	**100.00%**

* (ICD 10 – International Classification of diseases -10)

Prescription Data Analysis

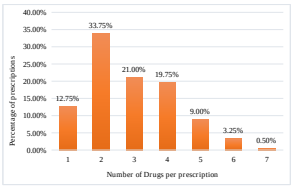
Analysis of Utilization Patterns According To Who Prescribing Drug Use Indicators

As summarized in Table 2, a total of 1161 drugs were prescribed to 400 participants, with an average of 2.90 ± 1.33 drugs per prescription. Of these, 90.09% were prescribed using generic names. The highest proportion of prescriptions (33.75%) contained two drugs, while 12.75% had only one drug (Figure 1). Among the total drugs prescribed, 894 (77.00%) were psychotropic medications, with an average of 2.2 ± 1.03 psychotropic drugs per prescription. Of these, 93.51% were prescribed by generic name and 6.49% by brand name. Of the 1161 drugs prescribed, 858 (73.90%) were from NLEM India 2015; among 894 psychotropic drugs, 618 (69.13%) were from the list. Only 7 (1.75%) of 400 prescriptions included injections, totalling 10 (0.81%) injectable drugs. Of the psychotropics, 4 (0.44%) were injectables, with Flupenthixol being the only one. Other injectables included Thiamine and B-complex vitamins. No prescriptions included antibiotics.

Table 2: Analysis Of Prescription Patterns According To WHO Prescribing Drug Use Indicators

Sr. No	WHO prescribing drug use indicators	Results
1	Average number of drugs per prescription	2.90 ± 1.33
2	Average number of psychotropic drugs per prescription	2.2 ± 1.03
3	Percentage of psychotropic drugs prescribed from NLEM	69.13%
4	Percentage of psychotropic drugs prescribed by generic name	93.51%
5	Percentage of prescriptions with psychotropic injection prescribed	0.44%
6	Percentage of prescriptions with an antibiotic prescribed	0.00%

Figure 1: Distribution of prescription as per the number of drugs prescribed per prescription



Utilization of Psychotropic Drugs in Various Psychiatric Illnesses

Of the 1161 prescribed drugs, antidepressants (32.04%) were the most common psychotropics, followed by antipsychotics (19.64%), sedative-hypnotics (14.73%), mood stabilizers (6.98%), and miscellaneous psychotropics (3.62%). For analysis, schizophrenia, schizoaffective disorder, and psychosis were grouped as psychotic disorders; Generalized Anxiety Disorder (GAD), Mixed Anxiety Disorder (MAD), obsessive compulsive disorder (OCD), panic disorder, somatoform & conversion disorder as neurotic & related disorders; and recurrent depressive disorder, Bipolar affective disorder (BPAD) and mania as mood (affective) disorders. Substance-related conditions like alcohol and cannabis dependence, withdrawal syndromes, and tobacco dependence were categorized as "Others."

As shown in Table 3, antidepressants were primarily prescribed for mood disorders (48.4%) and neurotic disorders (43%). Antipsychotics were most commonly used in psychotic disorders (63%), followed by mood disorders (20%). Mood stabilizers were mainly used in mood disorders (67%), particularly BPAD and mania. Sedative-hypnotics were commonly adjuncts in mood (40.9%) and neurotic disorders (33.3%).

Miscellaneous psychotropics included drugs like Nicotine and Naltrexone, used in tobacco and cannabis dependence, while Acamprosate was prescribed for alcohol-related disorders. Propranolol, also categorized under miscellaneous, was used in select cases of psychotic, neurotic, and mood disorders.

Table 3: Use of psychotropic drugs in various psychiatric illness

Psychiatric illness	**Antidepressants drugs N (%) ***	**Antipsychotic drugs N (%) ***	**Mood stabilizers N (%) ***	**Sedative-Hypnotics N (%) ***	**Miscellaneous drugs N (%) ***
Psychotic disorders	24 (6.5)	144 (63)	11(14)	33(19.3)	4(10)
Neurotic & related disorders	160 (43)	30 (13)	10(12)	57(33.3)	9(21)
Mood	180 (48.4)	46 (20)	54(67)	70(40.9)	14(33)

(Affective) Disorders					
Others	8 (2.2)	8(4)	6(7)	11(6.4)	15(36)
Total	372 (100)	228 (100)	81 (100)	171(100)	42(100)

* N (%) =Number of drug & percentage out of total drugs

Prescription Pattern

In this study, 372 antidepressants were prescribed out of 894 psychotropics. Selective serotonin reuptake inhibitors (SSRIs) were the most common (210, 57.07%), followed by Tricyclic antidepressants (TCAs) (133, 36.14%), atypical antidepressants (18, 4.89%), and serotonin-norepinephrine reuptake inhibitors (SNRIs) (7, 1.90%). Escitalopram was the most frequently prescribed antidepressant. Among 228 antipsychotics, atypical antipsychotics were most frequent (174, 76.32%). Typical antipsychotics included Butyrophenones (29, 12.72%), Phenothiazines (21, 9.21%), and Thioxanthenes (4, 1.75%). Olanzapine was the most prescribed antipsychotic.

Of the 81 mood stabilizers prescribed, anticonvulsants accounted for 73 (90.12%), with sodium valproate being the most common. Lithium carbonate was prescribed in only 8 cases (9.88%). Out of 171 sedative-hypnotics, benzodiazepines were the most frequently used (153, 89.47%), followed by melatonin (11, 6.43%) and non-benzodiazepines (7, 4.09%). Clonazepam was the most commonly prescribed in this category. Among 42 miscellaneous psychotropics, propranolol which is used for anxiety symptoms, was most common (28, 66.67%), followed by Acamprosate and Nicotine (6, 14.29% each), and Naltrexone (2, 4.76%). Details are provided in table 4.

Table 4: Number and Percentage Distribution of Various Psychotropic Drugs.

Sr. No.	Drug class	Drug names	Number (%)
1	Antidepressants	Escitalopram Amitriptyline Imipramine Fluoxetine Mirtazepine Paroxetine Clomipramine Sertraline Fluvoxamine Desvenlafaxine Bupropion Duloxetine	166 (44.62%) 97 (26.08%) 25 (6.72%) 22 (5.91%) 16 (4.30%) 12 (3.23%) 11 (2.96%) 9 (2.42%) 5 (1.34%) 5 (1.34%) 2 (0.54%) 2 (0.54%)
2	Antipsychotics	Olanzapine Risperidone Haloperidol Trifluoperazine Aripiprazole Clozapine Amisulpride Quetiapine Flupenthixol	89 (39.04%) 39 (17.11%) 29 (12.72%) 21 (9.21%) 19 (8.33%) 14 (6.14%) 7 (3.07%) 6 (2.63%) 4 (1.75%)
3	Mood Stabilizers	Sodium valproate Lamotrigine Oxcarbazepine Lithium carbonate Carbamazepine	47 (58.02%) 15 (18.52 %) 8 (9.88%) 8 (9.88%) 3 (3.70%)
4	Sedative - hypnotics	Clonazepam Lorazepam Diazepam Melatonin Zolpidem	69 (40.35%) 62 (36.26%) 20 (11.70%) 11 (6.43%) 7 (4.09%)

		Alprazolam	2 (1.17%)
5	Miscellaneous Psychotropics	Propranolol Acamprosate Nicotine Naltrexone	28 (66.67%) 6 (14.29%) 6 (14.29%) 2 (4.76%)

Psychotropic fixed-dose combinations: Out of the total of 400 Prescriptions only 4 prescriptions contained psychotropic fixed-dose combinations. Escitalopram 10mg + Clonazepam 0.25mg was the only FDC utilized in this study and accounted for only 4 (0.44%) of the total 894 psychotropic drugs.

Different concomitant drugs prescribed: Among the total 267 concomitant drugs prescribed, Benzhexol was the most frequently prescribed drug, accounting for 106 (39.70%). Omeprazole ranked second on the list (46, 17.23%), followed by Multivitamin B-Complex (MVBC) tablet (42, 15.73%), Pantoprazole (29, 10.86%), Bisacodyl (22, 8.24%), Calcium Carbonate (9, 3.37%), Lactulose with (7, 2.62%). Inj. Thiamine and Inj. B Complex Vitamins, the last two medications on the list, each accounted for 3 (1.12 %).

DISCUSSION

In the present study, males constituted a larger proportion (55%) of the participants compared to females (45%), a trend supported by previous research.[9,10] Nearly half (49%) of the subjects were aged 30 – 49 years, aligning with findings from Tejus et al. [5] and Rode et al. [11] Higher incidence in this age group may be due to increased pressure of family sustenance, work pressure, social pressure, or due to improved mental health literacy in this age group.

Among 400 participants, depressive disorders emerged as the most common psychiatric condition (30.75%), followed by anxiety disorders such as GAD and MAD. These observations are consistent with prior studies[8,10,11] and align with Dandona et al.[3], who highlighted depression and anxiety as the most prevalent adult mental disorders in India. A total of 96 patients had some kind of a medical comorbid condition, and such chronic illness could be a contributing factor for the development of depressive and anxiety disorders.

Although not empirically established, the WHO has suggested reference values for the prescribing drug use indicators. However, WHO acknowledges that actual prescribing patterns may deviate significantly from these standard values. This is because, the indicators particularly the rate of antibiotic and injection use and average medicines per encounter are influenced by the presenting case mix at a facility or within a region.[12] The average number of drugs per prescription was 2.90 ± 1.33, which exceeds the WHO's optimal value (<2).[12] The average number of psychotropic drugs per prescription was 2.2 ± 1.03. These findings were marginally greater than that observed in a study conducted by Thakkar K et al., where the average number of drugs per prescription was 2.01 ± 1.03 and the average number of psychotropic drugs per prescription was 1.79 ± 1.02.[13] Other studies [3,14] also reported a lesser number of average psychotropic drugs per prescription. Generally, a greater number of drugs per prescription points toward the practice of polypharmacy, which is a global phenomenon and associated with undesirable consequences. Here, it may be noted that the average number of psychotropics per prescription was only 2.2, but the average number of medicines per prescription was higher (2.90), which shows significant use of drugs other than psychotropics, which are often used to augment treatment or to counter/prevent side effects of psychotropics.

The WHO proposes that optimally, all medicines (100%) should be prescribed by generic names.[12] In the study, 93.51% of psychotropic drugs were prescribed by their generic names and this number is much greater than that observed in similar studies.[10,11,15] A large number of drugs were prescribed by generic names which indicates a further step towards the practice of rational prescribing in this setup. The utilization of psychotropic drugs from NLEM India 2015 was higher (69.13%) as compared to the findings of similar studies done by Tejus et al. (55%) [5] and Rode et al (44.23%).[11] The primary purpose of NLEM is to promote rational use of medicines considering the three important aspects i.e., cost, safety and efficacy.[16] As per WHO, all medicines prescribed at Primary Health Care facilities should be from the national essential list hence the optimal value for this indicator is 100%.[12] At this tertiary

care center, the large proportion of drugs (69.13%) prescribed was from NLEM 2015 and the use of drugs that are not listed in NLEM accounted for a smaller portion, and their use can be explained by the fact that the NLEM 2015 consists of only four antipsychotics and five antidepressants and this list of medicines may be adequate for smaller peripheral centres, it becomes inadequate for providing the standard of care at a tertiary care center. It is observed that the use of psychotropic injectable drugs in our study was lesser (0.44%) as compared to findings of similar studies done in India.[5,11,13] The WHO proposed an optimal value for this indicator (<20%).[12] The lesser use of injectables is a step forward in reducing the irrational use of injections, as unnecessary use of injections may result in blood-borne infections, increased cost of treatment and discomfort to the patients. In this centre depot formulation of Flupenthixol decanoate (20mg) was the only psychotropic injection prescribed which was given through the intramuscular route once every month for maintenance treatment of Schizophrenia. This finding is contrary to the findings of many other similar studies in India which reported that the most commonly prescribed injection was Haloperidol.[8,11,13] Better tolerability, rapid onset of action could be the reasons for prescribing flupenthixol in this setup.

Among the total antidepressants prescribed SSRI was the most common class followed by TCA and Escitalopram was the most frequently prescribed antidepressant drug. This trend is in accordance with similar studies done by Grover et al.[9], Chawla S. et al.[10], Rode S et al.[11], and Tripathi et al.[17] The safety in overdose, relative tolerability, lower cost and variety of uses of SSRIs are the main reasons for their popularity. Escitalopram has a more favourable pharmacokinetic profile than other SSRIs, including fewer pharmacokinetic drug interactions, which may explain why it is the most widely used SSRI.

Use of atypical antipsychotics (76.32 %) far exceeded that of the typical ones (23.68 %). Olanzapine (39.04%) and risperidone (17.11%) were the two most commonly prescribed antipsychotics. This antipsychotic use trend is consistent with a study done in Delhi by Kumar S et al.[15] and numerous other similar studies in India.[5,9,10] NICE guidelines for the treatment and management of psychosis and Schizophrenia suggest that the choice of antipsychotic medication should be made by the psychiatrist as per the requirements and needs of the patients.[18] The increased preference for atypical antipsychotics can be attributed to their effectiveness in managing negative symptoms of schizophrenia, their utility in treatment-resistant cases, and their expanding use in mood disorders like bipolar disorder. These medications also tend to have a more favourable side effect profile, including lower risks of extrapyramidal symptoms and relapse. A broader spectrum of efficacy covering schizoaffective disorders, BPAD and mania might be the reason for the greater usage of olanzapine than other atypical antipsychotics.

Sedative-hypnotics are commonly prescribed as adjunctive drugs in various psychiatric disorders for rapid and short-term symptom relief in the initial stage of the disease. Clonazepam was the most commonly prescribed drug in this study and similar finding was observed in other studies, [10,19] possibly because of its longer half-life and empirical eliciting of fewer withdrawal reactions upon discontinuation. Out of a total of 1161 drugs prescribed in the study, only 171 (14.72%) were sedative hypnotics. The use of sedative-hypnotics in this center is notably lower than other studies [10,11] done in India, suggesting a shift towards judicial sedative-hypnotic use.

It is found that Sodium valproate (52.02%) was the most commonly prescribed mood stabilizer followed by Lamotrigine (18.58%) for the treatment. Comparable results were observed in similar studies.[9-11,20] In contrast to our study findings, a study done in Lucknow by Trivedi et al. reported that Lithium was the most commonly prescribed mood stabilizer.[21] A study done by Kessing L et al.in Denmark reported that, treatment with lithium seems in general to be superior to treatment with valproate.[22] However, in this study, lithium constituted only 9.88% of total prescribed mood stabilizers. The lesser use of Lithium can be attributed to the concern about its narrow therapeutic index and difficulty in obtaining optimum plasma drug levels of lithium.

Propranolol (66.67%), a non-selective beta blocker, was the most widely used drug in the category of miscellaneous psychotropics and this finding is in accordance with other similar studies.[5,20] Propranolol is commonly prescribed for various anxiety disorders to relieve physical symptoms. Nicotine gum was used as Replacement Therapy to achieve abstinence from tobacco use. For alcohol use

disorder, acamprosate is prescribed as it is believed to restore imbalances between glutamate and GABA in the brain. It is safer for patients with liver disease. Naltrexone is an opioid receptor antagonist and it used in the management of Alcohol use disorder. The use of psychotropic FDCs in our study is found to be much less as compared to findings of similar studies[11,15] conducted in India pointing toward rationality in prescriptions.

Concomitant drugs accounted for 23% of all prescriptions, with Benzhexol being the most commonly used, particularly alongside antipsychotics. This aligns with previous Indian studies.[9,11,13] Although frequently prescribed to prevent extrapyramidal side effects, the WHO advises limiting anticholinergics like Benzhexol to short-term use in select cases. Proton pump inhibitors such as Pantoprazole and Omeprazole were used to manage gastrointestinal side effects linked to psychotropics. Constipation, often caused by the anticholinergic properties of typical antipsychotics and tricyclic antidepressants, may have led to the observed use of laxatives like Bisacodyl and Lactulose.

Limitations of this study was its cross-sectional observational design and hence long-term prescription trends could not be assessed.

CONCLUSION

In our study, it is observed that WHO prescribing drug use indicators largely conform to standard recommendations for developing countries. The preference for newer medications appeared to be driven by their improved safety and tolerability. The percentage of prescribing by generic name and prescribing from NLEM was higher in comparison to similar studies done at other centers; however, the issue with a higher number of drugs per prescription needs to be addressed. This issue of polypharmacy can be studied for appropriateness of medications with specific indicator like Medication appropriateness index which was not a part of our study plan. We also did not evaluate factors such as patient care indicators, health facility indicators, cost of treatment. Additional investigations are required to overcome the limitations identified in this study. This study provides baseline data on psychotropic drug use and can be utilized to conduct further studies on individual psychotropics.

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