



(RESEARCH ARTICLE)



Drug utilization study in the department of psychiatry

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International Journal of Science and Research Archive, 2023, 08(01), 740–753

Publication history: Received on 24 December 2022; revised on 06 February 2023; accepted on 09 February 2023

Article DOI: <https://doi.org/10.30574/ijrsra.2023.8.1.0119>

Abstract

Psychiatry disorders are creating its own place in morbidity these days. Various factors like cost of drugs, local paradigms, etc, plays a critical role for selecting the appropriate therapy for a particular patient because usually they are chronic therapy. Keeping this in mind, we conducted a study to delineate the various drugs used in psychiatric disorders, to find discrepancies. Drug utilization studies are essential for correct use of drug. Our study identifies the problems that arise from drug usage in health care delivery system and highlights the current approaches to the rational use of drugs. A total of 518 patients' data were collected during the period and analyzed for WHO recommended prescribing and complementary indicators. Study shows low incidence of poly pharmacy which is good as poly pharmacy is common in psychiatry and also use of injections was very low. Study shows that prescribing from WHO List of Essential Medicine was not as good as it accounted for only 21.3%. There is scope for improvement in case of medicines prescribed by generic name as none were prescribed by generic name. The average cost per prescription in our study was only 9.41 Indian rupees per day which is affordable by the majority of the patients.

Keywords: Drug utilization; Rational use of drugs; Psychiatry drugs; Clinical Pharmacist role; Psychiatry

1. Introduction

In many countries today ensuring the rational use of drugs is one of the most pressing problems faced by public health providers and administrators. WHO published its report on selection of essential drugs in 1977 bringing in the concept of essential drug program to promote rational drug use¹. The Conference of Experts on the Rational Use of Drugs, convened by the World Health Organization (WHO) in Nairobi in 1985, defined rational use as follows: The rational use of drugs requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community². Rational drug use implies an individual approach to patient treatment. Successful goal of therapeutic outcome depends upon the prescriber ability to diagnose, prefer the correct drug and prescribe the apt dosage form and route of administration, minimizing drug interactions and adverse events and take measures for no duplication of therapy. Further, rational drug use depends on the performance of the pharmacy and nursing departments in preparing and administering drugs. Implementation of hospital drug formulary systems helps to optimize treatment, make essential drugs available, and control costs of therapy. The drug formulary can be considered the basis of rational drug use. However not only prescriber but the patient also have to use the drug with adherence to get the correct benefit or desired therapeutic outcome. One mechanism to ensure correct prescribing and use is the drug utilization review (DUR) process; although often considered a component of a drug formulary system, DUR programs can exist in the absence of other formulary activities³. Study of drug utilization pattern in a particular setting gives an idea about the prescribing practices and characterizes the early signals of irrational drug use. With the help of WHO prescribed drug use indicators and concept of defined daily doses (DDD) it is possible to compare drug utilization patterns between different settings⁴. DUR programs are carefully planned by the medical staff to include the drugs considered to be most problematic if not used

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correctly. By comparing actual drug use to predetermined standards, DUR can detect inappropriate and/or unnecessarily costly drug therapy. Programs are designed to monitor individual drugs, or drug classes, as well as to monitor drug use in specified diseases. When problems are identified, interventions are designed and implemented to improve drug use. The interventions founded will be helpful in modification of hospital drug formulary and some procedures. By conducting educational programs the need of providing drug information increases.

The aim of this study is to evaluate the drug utilization in the psychiatry department of a public teaching hospital using WHO recommended prescribing indicators. Psychotropic medications are widely prescribed and the utilization of psychotropic drugs is increasing all over the world⁵. However data on the utilization of psychotropic drugs are lacking in India.

1.1. Importance of clinical pharmacology in the dur process

Clinical pharmacology is a medical discipline that links pharmacological and clinical expertise in order to promote rational use of drugs. The likelihood of a DUR program being accepted by the hospital medical staff, and becoming a tool for optimizing drug therapy will be greatly increased if the personnel involved in the program have adequate knowledge of clinical pharmacology. This is especially true when selecting or developing criteria. Various types of specialized knowledge that can enhance the effectiveness of a DUR program include:

- Disease etiology
- Dosage forms, and routes of administration
- Differences in drug requirements depending on severity of disease
- Drug-disease contraindications
- Adverse drug reactions
- Pharmacokinetics
- Combination therapy

1.1.1. Drug utilization studies in psychiatry setting

Psychotropic drug utilization rates can be useful in monitoring treatment for mental disorders on a population basis. Moreover, they provide information regarding rational drug use, given current knowledge regarding the risks and benefits of a given medication. In any DUR study it is important to link data on drug usage with the diseases or conditions for which the medicines are prescribed as it gives a better picture on the overall trend of drug use pattern. In order to achieve this, it is useful to properly classify the diseases. The International Classification of Diseases (ICD) published by WHO and Diagnostic and Statistical Manual of Mental Disorders (DSM) by the American Psychiatric Association (APA) are two such coding systems that are widely used. The coding system utilized by the DSM-IV is designed to correspond with codes from the ICD.

Objectives

The objectives of this study were:

- To evaluate the drug utilization in the psychiatry outpatient department using WHO prescribing indicators.
- To assess the prescriptions for the WHO recommended complementary indicators.

2. Material and methods

2.1. Design

The study was descriptive, cross sectional and open study.

2.2. Participants

All the patients attending the Psychiatry OPD over a 5 months period were covered in the study.

2.3. Inclusion criteria

- Patients of both sexes
- Patients of all ages
- All patients receiving psychotropic drugs for various indications.

2.4. Exclusion criteria

- Prescription with incomplete information.
- Patients admitted in the indoor department after being referred from the psychiatry OPD
- Cases of substance abuse, mental retardation and deferred diagnosis.

2.5. Testing tool

The prescribing indicators as well as the complementary indicators recommended by the WHO were used to assess the drug utilization pattern.

2.6. Data analysis

The data obtained were analyzed for the calculation of the prescribing and complementary indicators.

The various prescribing indicators are as follows

- Average number of medicines per encounter
- Percentage of medicines prescribed from WHO Essential Medicine List
- Percentage of medicines prescribed by generic name
- Percentage of encounters with an injection prescribed

Apart from this the following complementary indicators were also determined.

- Average drug cost per encounter
- Percentage of drug cost spent on psychotropic drugs
- Percentage of drug cost spent on Injections

The prescribing and utilization pattern of the medicines were carried out with reference to WHO Essential Medicines List 2009 16th edition. The data were organized using ATC/DDD methodology. The data were analyzed with respect to the age, sex and diagnosis of the patients.

2.7. Statistical consideration

Descriptive statistics was used for the analysis of data. The data obtained was represented as mean \pm SEM and percentages, as applicable. Drug data and patient characteristic data were computed using MS Excel version 2010 and SPSS version 16.0 statistical package. Appropriate statistical tests (Fisher's exact test, Student's t- test and One way Analysis of Variance, ANOVA) were used for determining association between variables. A difference was considered as significant if the P value was less than 0.05.

3. Results

The results presented below are for 518 patients' data obtained from the outpatient clinic of psychiatry.

3.1. Patients Profile

Out of 518 patients 55.8% (289 Patients) were male and 44.2% (229) were female.

All the patients were divided into seven age groups – upto 14 years (A), 15 to 25 years (B), 26 to 35 years (C), 36 to 45 years (D), 46 to 55 years (E), 56 to 65 years (F) and above 65 years (G). Majority of the patients attending the psychiatry OPD [408 (78.8 %)] were between the age group of 15 to 45 years (Figure No.1.).

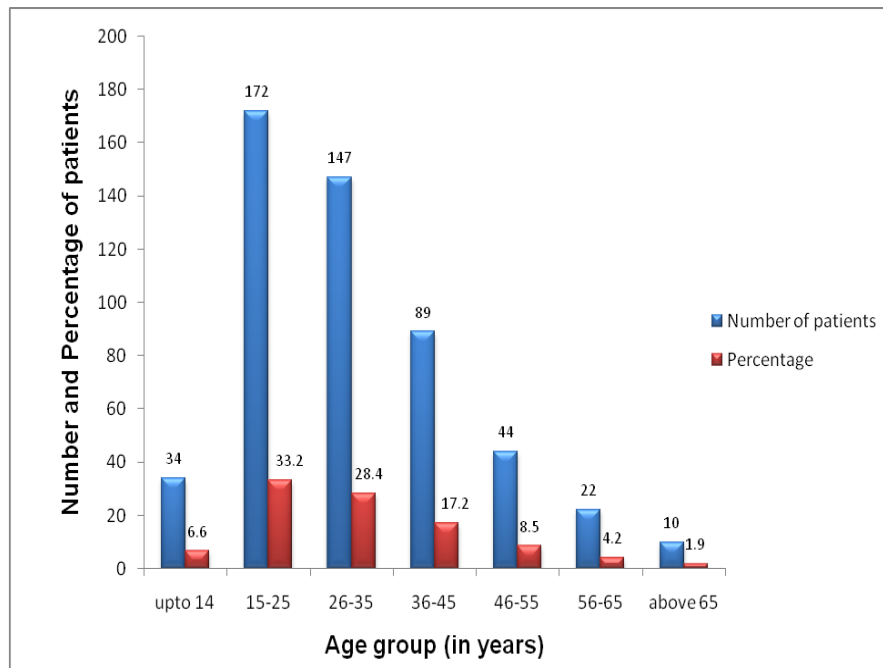


Figure 1 Age Group Wise Distribution of Patients

3.2. Prescribing indicators

The prescribing indicators were calculated for all the patients and for the seven age groups to determine any differences in prescribing between these age groups.

3.2.1. Average number of medication per prescription

Table 1 Distribution of Average number of medication per prescription

	Total		Male (n = 289)		Female (n=229)	
	No. of drugs	Mean±SEM	No. drugs	Mean± SEM	No. of drugs	Mean± SEM
All drugs	1000	1.93 ± 0.03	557	1.92 ± 0.04	443	1.93 ± 0.04
Psychotropic drugs	948	1.83 ± 0.04	527	1.82 ± 0.04	421	1.84 ± 0.03

Table 2 Distribution of Average number of medication per prescription among different age groups

Age group (yrs)	Distribution of number of medications	
	No. of Drugs	Mean±SEM
upto 14	60	1.76 ± 0.14
15 - 25	319	1.85 ± 0.05
26 - 35	288	1.96 ± 0.06
36 - 45	179	2.01 ± 0.08
46 - 55	86	1.95 ± 0.11
56 - 65	45	2.05 ± 0.19
above 65	23	2.30 ± 0.30

A total of 1000 medicines were prescribed to 518 patients out of whom 948 were psychotropic drugs and the remaining 52 non-psychotropic drugs. Mean \pm SEM of medicines prescribed was 1.93 ± 0.03 . Mean \pm SEM of psychotropic drugs was 1.83 ± 0.04 . Mean \pm SEM of medicines prescribed for male patients was 1.92 ± 0.04 , while for female patients it was 1.93 ± 0.04 (Table No.1.). For different age groups average number of medicines per prescription were, 1.77, 1.85, 1.96, 2.01, 1.95, 2.05 and 2.30 respectively for group A, B, C, D, E, F and G (Table No.2.). It was found that in most of the prescriptions 2 drugs (57.14%) were prescribed (Table No.3.).

Table 3 Average number of medication per prescription

No of drugs per prescription	No of prescriptions	Percentage
0	0	0
1	137	26.45
2	296	57.14
3	69	13.32
4	16	3.09
Total	518	100

3.2.2. Percentage of medicines prescribed from WHO EML

Out of 1000 medicines only 213 (21.3%) medicines were prescribed from WHO Essential Medicine List (EML) 2009 16th edition. Lorazepam, fluoxetine and amitriptyline, contributed to majority of drugs prescribed from WHO List of Essential Medicines.

3.2.3. Percentage of medicines prescribed by generic name

All the drugs were prescribed by brand names. This could be due to shortage of psychotropic drugs in the hospital pharmacy.

3.2.4. Percentage encounter with an injection prescribed

Use of injection was very low and percentage encounter with an injection prescribed was 1.9 % (10 cases) only. All the injections were of depot antipsychotic preparations (9 fluphenazine and 1 flupentixol formulations) prescribed for schizophrenia. Injection was prescribed in three age groups only, with one injection prescribed in age group above 65 years, two and seven in age group 15–25 years and age group 26–35 years respectively.

3.3. Other parameters

3.3.1. Top ten medicines

Clonazepam was the most frequently prescribed medicine (138 cases) followed by olanzapine (126cases), lorazepam (100 cases) and escitalopram (77cases).A total of 76 different drugs were prescribed, out of which 59 were psychotropic drugs and there maining 17 non-psychotropic drugs. Of the 59different psychotropic drugs, 6 were combination preparations.

Among non-psychotropic drugs various multivitamin preparations top the list with 29 cases followed by antiulcer drugs. Combination drugs accounted for 8.3% of the total drugs i.e. 83 out of 1000 drugs. Risperidone and trihexyphenidyl combination tops the list with 35 cases followed by trifluoperazine and trihexyphenidyl (17 cases), flupentixol and melitracen (11 cases).

3.3.2. Prescribing frequencies of selected drug categories

Anxiolytics form the most frequently prescribed drug category (n = 272, 52.5%) followed by antidepressants (n = 266, 51.4%) and antipsychotics (n = 252, 48.6%). Sedatives and hypnotics constituted only about 8.3% i.e. 43 cases (Figure No 2.). Table No.4 and Figure No.3 show the prescribing frequency of the different categories of psychotropic medications versus sex. Females received a slightly higher percentage of anxiolytics (57.2%) than males (48.8%) while males received more hypnotics and sedatives (9.3%) than females (7.0%). However the differences were not

statistically significant, ($p = 0.06$, F-test 95% CI) and ($p = 0.42$, F-test 95% CI). The prescribing frequency of the tricyclic antidepressants ($p = 0.83$, F-test 95% CI) and selective serotonin reuptake inhibitors ($p = 0.61$, Chi square test 95% CI) were more for male patients but not statistically significant. There were slight differences in the prescribing frequencies of other different classes of drugs between male and female but not statistically significant.

Table 4 Prescribing frequencies of selected drug categories

Drug category			Number of patients with % of population					
			Total (n=518)	%	male (n=289)	%	female (n=229)	%
PSYCHOLEPTICS	Anxiolytics		272	52.5	141	48.8	131	57.2
	Hypnotics and Sedatives		43	8.3	27	9.3	16	7.0
	Antipsychotics	atypical	210	40.5	121	41.9	89	38.9
		classical	42	8.1	21	7.3	21	9.2
PSYCHOANALEPTICS	Antidepressants	TCA	22	4.2	13	4.5	9	3.9
		SSRI	194	37.5	111	38.4	83	36.2
		SNRI	30	5.8	14	4.8	16	7.0
		NDRI	4	0.8	3	1.0	1	0.4
		NaSSA	15	2.9	7	2.4	8	3.5
		other	1	0.2	0	0.0	1	0.4
	Antidepressant with Psycholeptics		25	4.8	15	5.2	10	4.4
	Anti-dementia drugs		8	1.5	4	1.4	4	1.7
Psychostimulants		7	1.4	6	2.1	1	0.4	
OTHER NERVOUS SYSTEM DRUGS	Anticholinergic/Dopaminergic agents		53	10.2	28	9.7	25	10.9
	Mood stabiliser and Anticonvulsant		21	4.1	15	5.2	6	2.6
	Antivertigo preparations		1	0.2	1	0.3	0	0.0
NON-PSYCHOTROPIC DRUGS	Vitamins		29	5.6	18	6.2	11	4.8
	Others		23	4.4	12	4.2	11	4.8

TCA = Tricyclic antidepressant; SSRI = Selective serotonin reuptake inhibitor; SNRI = Selective noradrenaline reuptake inhibitor; NDRI = Noradrenaline - dopamine reuptake inhibitor; NaSSA = Noradrenaline and specific serotonin reuptake inhibitor

Figure No.5 shows prescribing frequencies among sub-classes of major drug categories. Among patients receiving anxiolytics/hypnotics and sedatives groups (n=315) 86.3% received anxiolytics while 13.7% received hypnotics and sedatives. Among patients receiving antidepressants (n=266), 72.9% received SSRIs, 11.3% received SNRIs, 8.3% received TCAs, 5.6% received NaSSAs, 1.5% NDRI and 0.4% other antidepressants. Among patients receiving antipsychotics (n=252), 83.3% of them received atypical antipsychotics while only 16.7% received classical antipsychotics.

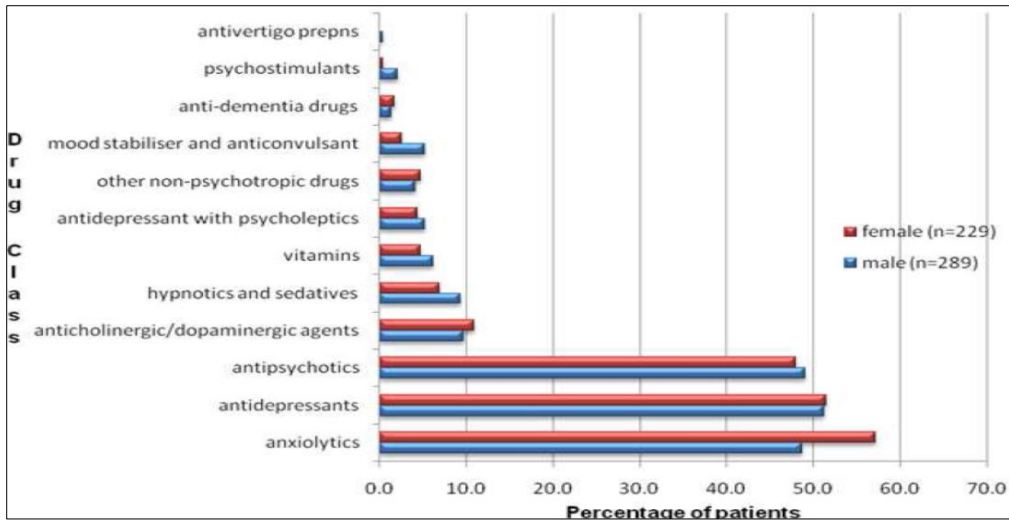


Figure 2 Prescribing frequencies of selected drug categories among male and female

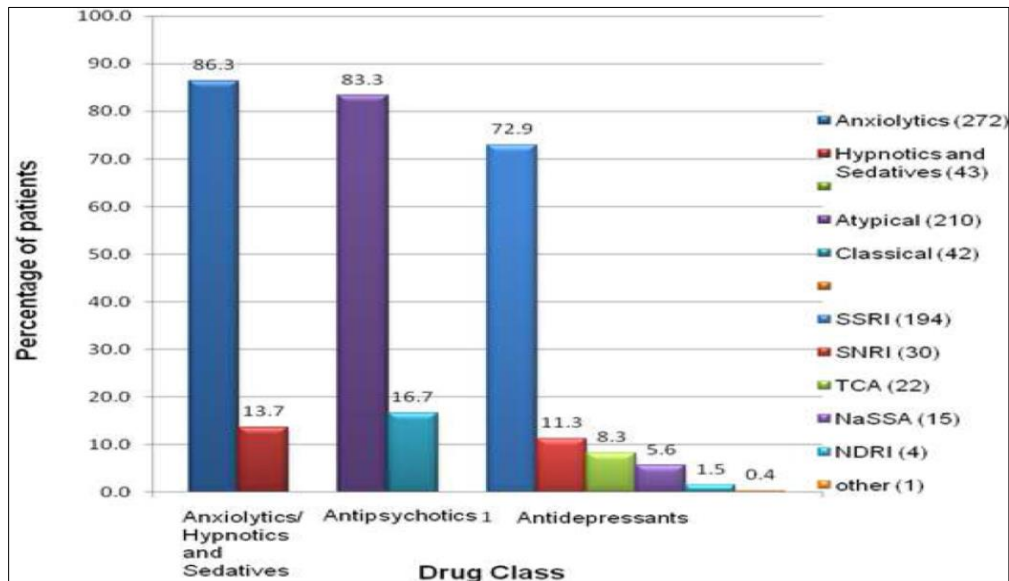


Figure 3 Prescribing Frequencies among sub-classes of major drug categories

3.3.3. Age-wise prescribing frequency for chosen drug categories

Table 5 Age-wise prescribing frequency for chosen drug categories

Drugs prescribed			Number of patients with % of population													
			0-14 (n=34)	%	15-25 (n=172)	%	26-35 (n=147)	%	36-45 (n=89)	%	46-55 (n=44)	%	56-65 (n=22)	%	> 65 (n=10)	%
PSYCHOLEPTICS	Anxiolytics		6	17.6	76	44.2	62	42.2	32	36.0	20	45.5	10	45.5	4	40
	Hypnotics and Sedatives		1	2.9	11	6.4	20	13.6	7	7.9	1	2.3	2	9.1		0
	Antipsychotics	Atypical	19	55.9	96	55.8	79	53.7	38	42.7	25	56.8	12	54.5	3	30
		Classic		0.0	11	6.4	11	7.5	13	14.6	3	6.8	3	13.6	2	20
PSYCHOANALEPTICS	Antidepressants	TCA		0.0		0.0	9	6.1	7	7.9	4	9.1	2	9.1		0
		SSRI	14	41.2	65	37.8	54	36.7	37	41.6	17	38.6	3	13.6	4	40
		SNRI		0.0	9	5.2	11	7.5	6	6.7	2	4.5	2	9.1		0
		NDRI		0.0	1	0.6	3	2.0		0.0		0.0		0.0		0
		NaSSA		0.0	1	0.6	5	3.4	5	5.6	3	6.8	1	4.5		0
		other		0.0	1	0.6		0.0		0.0		0.0		0.0		0
	Antidepressant with Psycholeptics			0.0	6	3.5	8	5.4	9	10.1	1	2.3		0.0	1	10
	Anti-dementia drugs			0.0		0.0		0.0	2	2.2		0.0	3	13.6	3	30
	Psychostimulants		6	17.6	1	0.6		0.0		0.0		0.0		0.0		0
Drugs prescribed			Number of patients with % of population													
			0-14 (n=34)	%	15-25 (n=172)	%	26-35 (n=147)	%	36-45 (n=89)	%	46-55 (n=44)	%	56-65 (n=22)	%	> 65 (n=10)	%
OTHER NERVOUS SYSTEM DRUGS	Anticholinergic / Dopaminergic agents		2	5.9	19	11.0	14	9.5	9	10.1	4	9.1	5	22.7		0
	Moodstabiliser and Anticonvulsant		1	2.9	11	6.4	4	2.7	3	3.4	2	4.5		0.0		0
	Antivertigo preparations			0.0		0	1	0.7		0.0		0.0		0.0		0
NON-PSYCHOTROPIC DRUGS	Vitamins		8	23.5	8	4.7	1	0.7	7	7.9	3	6.8		0	2	20
	Others		3	8.8	3	1.7	6	4.1	4	4.5	2	4.5	1	4.5	4	40

Above table shows the prescribing frequency of the different categories of psychotropic medications versus age. Among the patients receiving anxiolytics more than 60% patients were from the age group 15 to 35 years. Among patients receiving antipsychotics more than 40% were from the age group 15 to 25 years alone. Among patients receiving antidepressants more than 75% were from a wide range of age group 15 to 45 years. No clear trends of differences in prescribing frequency with age were observed. Variations in number of drugs per prescription among different age groups were not significantly greater than expected by chance ($p = 0.22$, One way ANOVA).

3.4. Diagnostic characteristics of the patients

The diseases encountered in the present study were organized according to International Classification of Diseases (ICD-10). Schizophrenia was the most common disease among the patients attending the psychiatry OPD (136 cases) followed by other common disorders like depressive episode (59 cases), anxiety disorders (49 cases) etc. Mixed presentation of depression with other disorders like anxiety, dissociative and somatic symptoms were also seen (29 cases). More than half of the patients presenting with schizophrenic disorders were of paranoid schizophrenia cases alone (74 cases). Further division of disorders among 59 cases of depressive episode showed the following data of mild depression (12 cases), moderate depression (4 cases), and severe depressive episode without psychotic symptoms (4 cases), severe depressive episode with psychotic symptoms (16 cases) and other unspecified depressive episode (23 cases). Out of 49 cases of anxiety disorders generalized anxiety disorder (GAD) numbered 19 cases and panic disorder 11 cases as in Table No.6

Table 6 Diagnostic characteristics of the patients

Sl. No.	Diseases	ICD-10	Male	Female	Total %
1	Schizophrenia	F 20	80	56	26.3
2	Depressive episode	F 32	26	33	11.4
3	GAD/panic disorder	F 41	32	17	9.5
4	Somatoform disorder	F 45	23	20	8.3
5	Dissociative disorder	F 44	11	22	6.4
6	Acute and transient psychotic disorder	F 23	12	19	6.0
7	Depression with anxiety/dissociative/somatic symptoms	-	14	15	5.6
8	Bipolar affective disorder	F 31	17	7	4.6
9	Dhat syndrome	F 48.8	12	0	2.3
10	Adjustment disorder	F 43.2	6	5	2.1
11	Obsessive compulsive personality disorder	F 60.5	6	5	2.1
12	Delusional disorder	F 22.0	4	4	1.5
13	Acute stress reaction	F 43.0	5	2	1.4
14	Mixed disorder of conduct and emotion	F 92	3	4	1.4
15	Manic episode	F 30	5	1	1.2
16	Postpartum depression	F 53	0	6	1.2
17	Attention deficit hyperactivity disorder ADHD	F 90.0	5	1	1.2
18	Nonorganic insomnia	F 51.0	5	0	1.0
19	Sexual dysfunction	F 52	5	0	1.0
20	Dementia	F 00/F 03	1	3	0.8
21	Phobic anxiety disorder	F 40.0	3	1	0.8
22	Schizoaffective disorder	F 25	3	0	0.6
23	Recurrent depressive disorder	F 33	1	2	0.6

24	Dysthymia, persistent mood affective disorder	F 34.1	1	2	0.6
25	Paranoid/schizoid personality disorder	F 60.0/F 60.1	0	3	0.6
26	Postencephalitic syndrome	F 07.1	2	0	0.4
27	Conduct disorder	F 91.0	2	0	0.4
28	Emotional disorder anxiety onset in childhood	F 93	2	0	0.4
29	Acute confusional state	-	1	0	0.2
30	Induced psychotic disorder	F 24	1	0	0.2
31	Habit and impulse disorders	F 63	0	1	0.2
32	Tourette disorder, tic disorder	F 95.2	1	0	0.2

3.5. Prescribing differences between male and female patients

On correlating data with respect to male and female patients it was found that there was no difference in prescribing of psychotropic drugs between the two groups with respect to number of drugs prescribed ($p = 0.64$, unpaired t-test, 95% CI).

4. Discussion

A prescription provides an insight into the nature of the health care delivery system⁴⁴. The role of the psychiatrist in ensuring compliance to the drug treatment cannot be over-emphasized. Average number of drugs in a prescription audit is an important factor because higher number increases the risk of drug interactions. This is especially important in psychiatry as polypharmacy is common and psychotherapeutic drugs have been over-prescribed and misused⁴⁵. The average number of drugs per prescription in our study ($n=1.93$) is comparable to that in Nepal³⁹, Switzerland⁴⁰ Spain⁴¹, India (Calicut)⁴² as shown in Table No.7. Only 16.41% of the patients received 3 or more drugs as compared to 40% reported from an Italian study⁴⁶. In the present study it was found that in most of the prescriptions 57.14%, 2 drugs were prescribed. As the mean number of prescriptions were found below two in the present study, the risk of ADRs due to drug interactions and errors of prescribing with polypharmacy were low. 8.3% of the drugs used were combination preparations and 21.3% of the drugs prescribed were from the WHO essential medicine list. All the drugs were prescribed by brand names. These are issues of concern which can be redressed to some extent by prescriber education. The reasons often cited for the use of such combination preparations namely convenience, improvement in compliance and lower cost hold true in the department. This is an important area where improvement will lead to cost effective and rational drug therapy as the drugs included in list of essential medicines are both therapeutically and cost effective.

Use of injection was very low and percentage encounter with an injection prescribed was 1.9 % (10 cases) only. All the injections were of depot antipsychotic preparations (9 fluphenazine and 1 flupentixol formulations) prescribed for schizophrenia. Previous studies had suggested that women received more psychotropic medications than men^{47,48}. However in our study no gender differences were found. Psycholeptics were the most commonly prescribed class of psychotropic drugs in the present study, of which anxiolytics topped the list. Clonazepam (138 cases) was the most frequently prescribed anxiolytic followed by lorazepam (100 cases) in this study. Clonazepam is one such benzodiazepine which has antiepileptic as well as anxiolytic properties. Although clonazepam falls under antiepileptics according to ATC/DDD classification, it had been grouped under anxiolytics because of its indications and low dose prescribing in the present study. This holds true across the different age groups and also in both genders. In most of the studies^{48,49} benzodiazepines were the frequently prescribed psychotropic drugs and this is in consonance with the present study.

Selective serotonin reuptake inhibitors (37.5%) were the most frequently prescribed antidepressants in this study and this is in consonance with other studies^{5,42}. In a study in Canada⁵⁰ SSRIs (17.5%) were the most frequently prescribed antidepressants followed by venlafaxine (7.4%). In the same study⁵⁰ sedatives and hypnotics were prescribed in 3.1% of the population while in the present study they accounted for 8.3%. Escitalopram (77 cases) was the most frequently prescribed SSRI followed by fluoxetine (56 cases) and paroxetine (46 cases) in the present study. While fluoxetine was the most frequently prescribed SSRI in the Calicut⁴² study. However in other studies tricyclic antidepressants remain the most frequently prescribed class of antidepressants^{39,46,51}. Analysis of the prescriptions of psychotropic drugs in this study revealed that the most commonly prescribed antipsychotics were olanzapine (24.3%) followed by risperidone

and risperidone with trihexyphenidyl combination (11.8 %), trifluoperazine with trihexyphenidyl combination (3.3%). An Indian study had identified olanzapine as the most commonly prescribed antipsychotic drug⁵².

Table 7 Comparison of current study with other studies

Indicators	Current study India (2009)	Shankar et al Nepal (2002)	Schulz et al Switzerland (1984)	Cuevas et al Spain (2004)	Padmini et al India (2007)
	Psy. OPD	Psy. OPD	Psy. setting	Psy. setting	Psy. IPD
Number of prescriptions	518	239	403	2647	1159
Average no of drugs/ prescription	1.93	1.75	1.8	1.63	1.8
% drug prescribed with generic names	0	29.7%	-	-	-
% drugs prescribed from EDL	21.3%	29.48%	-	-	-
duration	150 days	45 days	90 days	-	365 days

In the present study atypical antipsychotics (40.5%) were more commonly prescribed compared to classical antipsychotic drugs (8.1%). Another Indian study at Calicut⁴² showed similar pattern with atypical antipsychotics (53.2%) and classical antipsychotic drugs (8.4%), however risperidone (31%) was identified as the most commonly prescribed antipsychotic followed by olanzapine (12.3%) and quetiapine (6.5%)⁴². Haloperidol was identified as the commonly prescribed antipsychotic drug in the study conducted by McCue *et al*⁵³. In the present study the commonly prescribed classical antipsychotics were trifluoperazine (3.3%) followed by fluphenazine (1.7%) and chlorpromazine (1.4%) while the commonly prescribed atypical antipsychotics were olanzapine (24.3%) followed by risperidone (11.8%), aripiprazole (1.15%) and quetiapine (1.15%). In a study in France the commonly prescribed atypical antipsychotics were olanzapine followed by risperidone, amisulpride and clozapine⁵⁴. The value of medical audits for generating and testing hypotheses on inappropriate prescribing has resulted in educational interventions to improve prescribing patterns⁵⁵. The information can be used to develop adverse drug reaction monitoring programs also. Polypharmacy increases the risk of drug interactions and errors of prescribing. In our study the incidence of polypharmacy was low (1.93 drugs per prescription). In the present study schizophrenia was the most common disease among the patients visiting the psychiatry OPD (26.3%) The other common complaints were depressive episode (11.5%),

anxiety disorders (9.5%), somatoform disorders (8.3%), dissociative disorders (6.4%) etc. while in a study in Nepal³⁹ somatoform disorders were the most common complaint among the patients attending the psychiatry OPD (26.4%) followed by other common disorders like anxiety (14.2%) and depression (12.1%). Mixed presentation of depression with other disorders like anxiety, dissociative and somatic symptoms were also seen

(5.6%) in the present study. Majority of the patients attending the psychiatry OPD [408 (78.8 %)] were between the age group of 15 to 45 years. Among the patients receiving anxiolytics more than 60% patients were from the age group 15 to 35 years. Among patients receiving antipsychotics more than 40% were from the age group 15 to 25 years alone. Among patients receiving antidepressants more than 75% were from a wide range of age group 15 to 45 years. No clear trends of differences in prescribing frequency with age were observed in the present study.

The findings of our study, along with those of similar studies elsewhere in India and other countries showed slight but no major differences in terms of number of drugs per prescription. However there were similarities as well as conflicts of interest in the choice of certain classes of psychotropic drugs prescribed. Further studies in patient compliance with treatment and the dropout rate from psychiatric treatment are required. Studies in prescription audit of psychotropic drugs can be conducted to investigate the scope for improvement in prescribing practices.

5. Conclusion

- A total of 518 patients' data were collected during the period and analyzed for WHO recommended prescribing and complementary indicators.
 - Study shows low incidence of polypharmacy which is good as polypharmacy is common in psychiatry and also use of injections was very low.
 - Study shows that prescribing from WHO List of Essential Medicine was not so good as it accounted for only 21.3%.
 - There is scope for improvement in case of medicines prescribed by generic name as none were prescribed by generic name.
 - Psycholeptics were the most commonly prescribed class of psychotropic drugs in the present study, of which anxiolytics topped the list.
 - Selective serotonin reuptake inhibitors and atypical antipsychotics were the most frequently prescribed antidepressants and antipsychotics respectively in the present study.
 - No clear trends of differences in prescribing frequency with age and sex were observed in the present study
 - The issue of compliance was not addressed in the present study.
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Compliance with ethical standards

Acknowledgments

I thank Dr. Faisan Ali for his continuous support.

Disclosure of conflict of interest

Author declares no conflict of interest.

Statement of ethical approval

This is a prospective and observational study which involves collection of reports and Patient case sheet data and does not involve any invasive techniques like collection of blood samples.

Statement of informed consent

Informed consent was obtained from all the individuals.

References

- [1] Introduction to drug utilization research, WHO International Working Group for Drug Statistics Methodology, WHO Collaborating Center for Drug Statistics Methodology, WHO Collaborating Center for Drug Utilization Research and Clinical Pharmacological Services; 2003; *Geneva, Switzerland: WHO*, 2003.
- [2] The rational use of drugs. Report on the conference of experts Nairobi sponsored by W.H.O. *Geneva*, 1985, 25-9.
- [3] Moore T, Bykov A, Savelli T, Zagorski A. Guidelines for implementing drug utilization review programs in hospitals. [online]. 1997, 58. [1 screen].
- [4] WHO Collaborating Centre for Drug Statistics Methodology. Guidelines for ATC classification and DDD assignment, *Oslo: WHO Collaborating Centre for Drug Statistics Methodology*, 2002.
- [5] Pincus H A, Taniclian T L, Marcus S C, Olfson M, Zarin D A, Thompson J *et al*. Prescribing trends in psychotropic medications: primary care, psychiatry, and other medical specialties, *JAMA*, 1998, 279(7), 526-31.
- [6] Padmini Devi D, Amarjeeth R, Sushma M, Guido S. Prescription patterns of psychotropic drugs in hospitalized schizophrenic patients in a tertiary care hospital. Department of Pharmacology, St. John's Medical College, Bangalore, India. *Calicut Medical Journal*, 5(4), 2007, e3.
- [7] Yosselson S S, Sternik D, Liebenzon D. Prescribing patterns in psychiatric hospitals in Israel, *ActaPsychiatrSc and*, 60(5), 1979, 477-82.
- [8] Introduction to Drug Utilization Research by WHO, WHO Library Cataloguing-in- Publication Data ISBN 92 4 156234 X, *Printed in Oslo, Norway*, 2003, 24-5.

- [9] Introduction to Drug Utilization Research by WHO, WHO Library Cataloguing-in Publication Data ISBN 92 4 156234 X, *Printed in Oslo, Norway*, 2003, 17.
- [10] WaleedSweileh, NidalJaradat, Abed Alsalam Al-Khayyat. Typical and Atypical Antipsychotic Drug Utilization in a Psychiatric Clinic in Palestine, *An-Najah Univ. J. Res. (N.Sc)*, 2004, 18(1), 40-47.
- [11] Thomas R. Fulda, M A Alan Lyles, Sc D, M P H, BSPHarm; Mark C. Pugh, Pharm D and Dale B. Christensen, PhD Current Status of Prospective Drug Utilization, *Review J Manag Care Pharm*, 10(5), 2003, 333-31.
- [12] Moore T, Bykov A, Savelli T, Zagorski A. Guidelines for implementing drug utilization review programs in hospitals. [online]. 1997, 58. [1 screen]. Available from URL: <http://www.msh.org>
- [13] Drug Utilization Review- a Canadian process and methodology for studies of community based drug therapy: Canada's Research Based Pharmaceutical Companies, 2001.
- [14] Introduction to Drug Utilization Research by WHO, WHO Library Cataloguing-in- Publication Data ISBN 92 4 156234 X, *Printed in Oslo, Norway*, 2003, 33-7.
- [15] WHO Collaborating Centre for Drug Statistics Methodology. ATC/DDD Index 2010 [cited 2022 mar 24]; Available from URL:http://www.whocc.no/atc_ddd_index/
- [16] Introduction to Drug Utilization Research by WHO, WHO Library Cataloguing-in- Publication Data ISBN 92 4 156234 X, *Printed in Oslo, Norway*, 2003, 38-9.
- [17] WHO Collaborating Centre for Drug Statistics Methodology, ATC/DDD Index 2010 [cited 2022 mar 24];
- [18] Anker M, Brudon-Jacobowicz P, Fresle D A, VHogerzeil H. How to investigate drug use in health facilities: Selected drug use indicators, *Geneva, Switzerland: WHO*, 1993.
- [19] Guide to Good Prescribing, *WHO*, 1995, 25.
- [20] Moore T, Bykov A, Savelli T, Zagorski A. Importance of Clinical Pharmacology in the DUR Process. Guidelines for implementing drug utilization review programs in hospitals, *RPM-Russia*, 1997, 33-7.
- [21] The ICD-10 Classification of Mental and Behavioural Disorders, *WHO Geneva*, 1993, 1-263.
- [22] Diagnostic and Statistical Manual of Mental Disorders: *APA*, 4th Edition, 1994, 4.
- [23] Begaud B. Dictionary of Pharmacoepidemiology, Chichester, *England: John Wiley and Sons*, 2000, 1-171.
- [24] Verdoux H, Begaud B. Pharmacoepidemiology: what do (and don't) we know about utilisation and impact of psychotropic medication in real life conditions, *Br J Psychiatry*, 185(1), 2004, 93-4.
- [25] Cans C, Rotily M. Consumption of psychotropic drugs in the general population in the Irere District, *Rev EpidemiolSantePublique*, 39(6), 1991, 515-22.
- [26] Weyerer S, Dilling H. Psychiatric and physical illness, sociodemographic characteristics, and the use of psychotropic drugs in the community: results from the Upper Bavarian Field Study, *J ClinEpidemiol*, 44(3), 1991, 303-11.
- [27] Pariente P, Lepine J P, Lellouch J. Selfreported psychotropic drug use and associated factors in a French community sample, *Psychol Med*, 22(1), 1992, 181-90.
- [28] Turrina C, Zimmermann-Tansella C, Micciolo R, *et al*. A community survey of psychotropic drug consumption in South Verona: Prevalence and associated variables, *Soc Psychiatry PsychiatrEpidemiol*, 28(1), 1993, 40-4.
- [29] Brugha T S, Bebbington P E, Singleton N, *et al*. Trends in service use and treatment for mental disorders in adults throughout Great Britain, *Br J Psychiatry*, 185(3), 2004, 378-84.
- [30] Colman I, Wadsworth M E, Croudace T J, *et al*. Three decades of antidepressant, anxiolytic and hypnotic use in a national population birth cohort, *Br J Psychiatry*, 189(2), 2006, 156-60.
- [31] Ohayon M M, Lader M H. Use of psychotropic medication in the general population of France, Germany, Italy and the United Kingdom, *J Clin Psychiatry*, 63(9), 2002, 817-25.
- [32] Murray J, Dunn G, Williams P, Tarnopolsky A. Factors affecting the consumption of psychotropic drugs, *Psychol Med*, 11(3), 1981, 551-60.
- [33] Riska E, Klaukka T. Use of psychotropic drugs in Finland, *SocSci Med*, 19(9), 1984, 983-9.

- [34] Siciliani O, Bellantuono C, Williams P, Tansella M. Selfreported use of psychotropic drugs and alcohol abuse in South-Verona, *Psychol Med*, 15(4), 1985, 821-6.
- [35] Koenig W, Ruther E, Filipiak B. Psychotropic drug utilization patterns in ametroplitan population, *Eur J ClinPharmacol*, 32(1), 1987, 43-51.
- [36] Allgulander C. Psychoactive drug use in a general population sample, Sweden: correlates with perceived health, psychiatric diagnoses, and mortality in an automated record-linkage study, *Am J Public Health*, 79(8), 1989, 1006-10.
- [37] Vazquez-Barquero J L, DiezManrique J F, Pena C *et al.* Patterns of psychotropic drug use in spanish rural community, *Br J Psychiatry*, 155(3), 1989, 633-41.
- [38] Alonso J, Angermeyer M C, Bernert S, Bruffaerts R, *et al*, and the ESEMed/MHEDEA 2000 Investigators. Psychotropic drug utilisation in Europe: results from the European Study of the Epidemiology of mEntal Disorders (ESEMed) project, *ActaPsychiatrScand*, 109 (420), 2004, 55-64.
- [39] Shankar P R, Roy S. Patterns Of Prescription And Drug Use In A Psychiatry Out-patient Department In A Teaching Hospital In Western Nepal, *The Internet J Pharmacol*, 1(2), 2001, 1-10.
- [40] Schulz P, Straser O, Glauser D, Fischer W. Prescribing Patterns in an Outpatient Psychiatric Clinic, *Eur Arch PsychiatrNeurolSci*, 234(4), 1984, 220-3.
- [41] Cuevas C, Sanz E J. Polypharmacy in psychiatrc practice in the Canary Islands, *BMC Psychiatry*, 4(18), 2004, 1-8.
- [42] Padmini Devi D, Amarjeeth R, Sushma M, Guido S. Prescription patterns of psychotropic drugs in hospitalized schizophrenic patients in a tertiary care hospital. Department of Pharmacology, St. John's Medical College, Bangalore, India, *Calicut Med J*, 5(4), 2007, 3.
- [43] Rittmannsberger H, Meise U, Schauflinger K, Horvath E, *et al.* Polypharmacy in psychiatric treatment, Patterns of psychotropic drug use in Austrian psychiatric clinics, *European Psychiatry*, 14(1), 1999, 33-40.
- [44] WHO. WHO model list of essential drugs, *WHO Drug Information*, 13(4), 1999, 249-62.
- [45] De Girolamo G, Williams P, Cappiello V. Psychotropic drug utilization and audit in two Italian psychiatric services, *Psychol Med*, 17(4), 1987, 989-97.
- [46] Morabia A, Fabre J, Dunand J P. The influence of patient and physician gender on prescription of psychotropic drugs, *J ClinEpidemiol*, 45(2), 1992, 111-16.
- [47] Laporte J R. Towards a healthy use of pharmaceuticals, *Development Dialogue*, 3(2), 1985, 48-55.
- [48] Olivier M R. Psychological factors, compliance and resistance to antidepressant treatment, *Encephale*, 12(2), 1986, 197-203.
- [49] Yosselson S S, Sternik D, Liebenzon D. Prescribing patterns in psychiatric hospitals in Israel, *ActaPsychiatrScand*, 60(5), 1979, 477-82.
- [50] Cynthia A B, Williams J, Wang J L, Kassam A, *et al.* Psychotropic medication use in Canada, *Can J Psychiatry*, 50(4), 2005, 605- 13.
- [51] Tognoni G. Pharmacoepidemiology of psychotropic drugs in patients with severe mental disorders in Italy, Italian collaborative study group on the outcome of severe mental disorders, *Eur J ClinPharmacol*, 55(9), 1999, 685-90.
- [52] Freeman M P, Stoll A I. Mood stabilizer combination: a review of safety and efficacy, *Am J Psychiatry*, 155(1), 1998, 12- 21.
- [53] Mccue R E, Waheed R, Urcuo L. Poly pharmacy in patients with schizophrenia, *J Clin Psychiatry*, 64(9), 2003, 9.
- [54] Boulin M, Maach S, Serot D, Martin P, Alizon B, Vailleau J L. Prescribing practices of second generation antipsychotics in hospital units, *Therapie*, 60(6), 2005, 567- 72.
- [55] Mant A, Lansbury G, Bridges-Webb C. Trends in psychotropic drug prescribing in Australia, *Med J Aust*, 146(4), 1987, 208-10.