

PRESCRIBING PATTERN OF PSYCHOTROPIC AGENTS IN RURAL TERTIARY CARE TEACHING HOSPITAL

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Received: 03 November 2017, Revised and Accepted: 30 November 2017

ABSTRACT

Objectives: The objectives of the study were to study the prescribing pattern on psychotropic agents at psychiatric department at rural tertiary care teaching hospital, B.G. Nagara.

Methods: A prospective and observational study was conducted among psychiatric department (either sex) after considering inclusion and exclusion criteria for the period of 6 months and a total of 300 prescriptions were analyzed.

Results: A total of 300 psychiatric patients were enrolled, male 170 (56.67%) patients predominated over females 130 (43.33%) patients. Majority of participants were under age group of 31-40 years (28.6%), illiterate (75%), unemployed (52%), and married (84%). Prevalence of mood disorder 109 (36.33%) was high followed by substance used and addictive disorder 53 (17.67%), schizophrenia 46 (15.33%), and psychosomatic medicine 22 (7.33%). Antidepressant (28.59%) was the commonly prescribed group followed by benzodiazepines (14.81%), anticholinergic (7.18%), and anticonvulsants (7.18%). Tricyclic antidepressants drugs amitriptyline (53.44%) was most frequently prescribed an antidepressant. An average number of drugs per prescription was 2.32 out of which 16.91% of drugs were prescribed by their generic name.

Conclusion: Selective serotonin reuptake inhibitors (SSRIs) were the most common group, and escitalopram was the most common medication used among the SSRIs. Majority of the drugs were prescribed from essential drug list. This study advocated an overall rational utilization of psychotropic drugs with fewer deviations due to the socioeconomic status of patients and prescription practices of healthcare providers and need to improve prescribing habits to ensure rational use.

Keywords: Psychotropic agents, Prescription patterns, WHO guidelines.

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INTRODUCTION

An integral part of the primary healthcare system is the level of care responsible for providing basic healthcare services and taking care of public in the rural areas, without availability of necessary medicines modern healthcare system is impossible [1]. Medicines do not save a life either promote or prevent epidemic diseases. Prescription should be right to bring the optimal benefit and should be safe, efficacious, cost-effective, and rational [2].

The World Health Organization (WHO) defined the rational use of the drug as patients receiving medications appropriate to their clinical needs in doses that meet their own individual requirements, for an adequate period and at the lowest cost to them and their community. Thus, drug utilization is an essential part to make patients beneficial by economically [3,4]. In general, the use of the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost is called rational drug prescribing. Steps that are to be followed to fulfill the rational use of drugs are defining the patient's problems (diagnosis), defining effective and safe treatment (pharmacological and non-pharmacological), appropriate drugs, dosage, and duration, writing a good prescription to give patients adequate information, and planning to evaluate treatment responses [5,6].

Irrational prescribing practices leads to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress, and harm to the patient at a higher cost. Worldwide more than 50% of all medicines are prescribed, dispensed, or sold inappropriately, while 50% of patients fail to take them correctly [7]. These are common types of irrational medicine usage such as poly-pharmacy, inappropriate use

of antimicrobials, inadequate dosage, overuse of injections, failure to prescribe in accordance with clinical guidelines, and self-medication. Irrational use of medicine may result in serious morbidity and mortality, additional economic, wastage of resources, increased treatment cost, increased risk for adverse drug reactions (ADRs), and emergence of drug resistance leads to a reduction in quality of drug therapy [8].

Psychiatric disorders are the major problem in this current scenario. Hence, the psychotropic agents were prescribed based on the different psychiatric disorders as depression, schizophrenia, anxiety, insomnia, panic attack, attention deficit hyperactivity disorder (ADHD), obsessive-compulsive disorder (OCD), etc. According to the results of World Mental Health Survey, psychiatric diseases are prevalent all around the world, and among them, mood disorders and anxiety disorder are the most common ones with, respectively, 16% and 12% lifetime prevalence rates. These disorders have several physical and social complications for the individuals' health state [9].

Numbers of drugs are available for treatment of depression and psychosis with or without complications. Prescription of such drugs varies from physician to physician depending on the health status and complications due to these diseases. It is essential to understand the trend of the prescribing guidelines indicators to help injudicious and rational use of drugs. Hence, this study was aimed to observe the prescribing pattern of psychotropic agents at the psychiatric department.

METHODS

This was a prospective and observational study, conducted in Psychiatric Department at Adichunchanagiri Institute of Medical Sciences,

B.G. Nagara, Mandya (D), Nagamangala (T), Karnataka, India, over a period of 6 months. It is a 1050 bedded tertiary care teaching hospital situated in a rural area having both outpatient and inpatient service. The study was initiated after obtaining approval from Institutional Ethical Committee of Adichunchanagiri Hospital and Research Hospital (AH and RC), B.G. Nagara.

Study criteria

Inclusion criteria

Both sexes and different age group patients attending the psychiatry department of the hospital who were prescribed medications consented to participate in the study.

Exclusion criteria

Patients who were pregnant, lactating, and unable to comply due to mental retardation, unconsciousness and who did not consent were not included in the study.

Study procedure

During the study period, all patients attending the psychiatric department who met the inclusion and exclusion criteria were enrolled into the study after obtaining the written consent. Patient's proforma such as demographic details, clinical data, diagnosis, medications used and side effects if any were collected by reviewing the patient's case notes/prescriptions had documented. Psychotropic medicine received by the study population in this study was ascertained by not only the type of disease, class of drugs, and frequency of the drugs and strength of the drugs in the prescribed pro forma. Thereby, the pattern of psychotropic agents used in different subsets of the population was analyzed.

Possible ADRs were assessed using various articles, standard textbooks like Martindale the complete drug reference 36 edition. The identified drug-related problems were discussed with the physicians for further management.

Statistical methods

The data were entered into Microsoft Excel 2010 and analyzed. The prescriptions were classified based on patient's age, gender, education background, religion, and types of disease. Microsoft word and excel have been used to construct bar graph and tables.

RESULTS

The study was a prospective and observational study. A total of 300 patients with a diagnosis of psychiatric disorders and who were receiving at least one Psychotropic drug were included in the study. The various details of the patients are showed in Table 1. Table 1 summarized that out of 300 patients involved in the studies, 56.67% were male followed by female patients 43.33%. The ratio of male to female participants was found to be 1.30:1. In the present study, the majority of the psychiatric patients were age group of 31-40 years (28.67%) followed by 21-30 years (27.33%). The mean age of the participants was 38.14±8.43 years. Majority of the participants were married 252 (84%) and unemployed 156 (52%). Only 1% of the participants were employed. Majority of participants in the study were illiterate 225 (75%) followed by literate 75 (25%). The results were expressed as±standard error of the mean.

Out of 300 psychotropic patients, only a few patients 35 (11.67%) had a family history of the psychiatric disorders, and majority of patients had no history of psychiatric disorders 165 (88.33%). Among the psychotropic disease, the majority of patients were suffered from mood disorder 109 (36.33%), a substance used and addictive disorder 52 (17.67%) followed by Schizophrenia spectrum 46 (15.33%). Results of clinical details of the study population are depicted in Table 2.

Out of 696 drugs prescribed, antidepressant 199 (28.59%), benzodiazepines 117 (16.81%), anticholinergic, and anticonvulsant 50 (7.18%) each. Selective serotonin reuptake inhibitors (SSRIs) (n=91) were highly prescribed antidepressant followed by tricyclic

Table 1: Demographic details of the patients

Characteristics	Frequency n (%)
Gender	
Male	170 (56.67)
Female	130 (43.33)
Total	300 (100.00)
Age group (years)	
10-20	28 (9.33)
21-30	82 (27.33)
31-40	86 (28.67)
41-50	65 (21.67)
51-60	25 (8.33)
61-70	11 (3.67)
>70	3 (1.00)
Total	300 (100.00)
Marital status	
Married	252 (84.00)
Single	48 (16.00)
Total	300 (100.00)
Employment status	
Employed	03 (1.00)
Unemployed	156 (52.00)
Self-employed	141 (47.00)
Housewife	37 (12.33)
Business	41 (13.67)
Agriculture	63 (21.00)
Total	300 (100.00)
Education status	
Literate	75 (25.00)
Illiterate	225 (75.00)
Total	300 (100.00)

Table 2: Clinical details of the patients

Characteristics	Frequency n (%)
Family history	
Yes	35 (11.67)
No	265 (88.33)
Psychiatric disorder	
Schizophrenia spectrum	46 (15.33)
Mood disorders	109 (36.33)
Anxiety disorder	33 (11.00)
OCD	02 (0.67)
Trauma and stress-related disorder	05 (1.67)
Seizures/personality disorder	11 (3.67)
Psychosomatic medicine	22 (7.33)
Disruptive impulse - control and conduct disorder	13 (4.33)
Substance used and addictive disorder	53 (17.67)
Child psychiatry	06 (02)
Total	300 (100.00)

OCD: Obsessive-compulsive disorders

antidepressants drugs (TCAs) (n=58). Other than psychotropic agents, 130 (18.67%) patients received vitamin supplements followed by other drugs (proton pump inhibitor, nonsteroidal anti-inflammatory drugs) 25 (3.59%). Table 3 summarized the prescription pattern of the different class of the agent used.

Out of 300 prescriptions, the total number of drugs prescribed was 696. Among them, 532 (76.43%) drugs were psychotropic agents. Amitriptyline 31 (53.44%) was highly prescribed TCAs class of antidepressant compared to opipramol 27 (46.55%). Among all class of antidepressants prescribed escitalopram 59 (64.83%) (SSRIs) was major class followed by mirtazapine 33 (66%). Majority of typical antipsychotics prescribed were flupenthixol 11 (55%) followed by haloperidol 8 (40%) and chlorpromazine 1 (5%).

Out of 82 atypical antipsychotics prescribed olanzapine was most frequently prescribed 47 (57.31%) followed by risperidone

22 (26.82%). Lithium 11 (100) was only prescribed mood stabilizer. Among the anxiolytics as chlordiazepoxide 27 (90%) was highly prescribed followed by alprazolam 3 (10%). Out of 50 anticonvulsants drug, sodium valproate occupied highest rank 27 (54%) followed by topiramate 8 (16%) and phenytoin 8 (16%) each. In Barbiturates class only phenobarbitone 3 (100%) was prescribed. The anticholinergic drug, trihexyphenidyl 50 (100%) was prescribed among 300 patients. Table 4 summarized commonly prescribed psychotropic agents in the study.

Table 5 summarized the total 214 antidepressant drugs were used in depression and bipolar affective disorder (BPAD). Among all drugs prescribed, escitalopram (SSRIs) was prescribed high number 38 (17.75) of a patient followed by Trihexyphenidyl (anticholinergic) 24 (11.68), olanzapine (atypical antipsychotic) 22 (10.28). Valproic acid 1 (0.46%) was least prescribed agent for depression and BPAD.

Total number of 86 drugs were prescribed in Schizophrenia and psychosis followed by 1 drug prescribed in delusional disorder. Among the drug prescribed in schizophrenia and psychosis, trihexyphenidyl (anticholinergic) was highly prescribed 19 (22.09%) followed by atypical antipsychotic drugs olanzapine 17 (19.76%), risperidone 16 (18.60%), and atypical antipsychotic drug flupenthixol 6 (6.97%). In case of delusion disorder, only olanzapine 1 (100%) was prescribed. Table 6 summarized the list of drugs which were prescribed in the subtype of psychiatric disorders.

In this study, we found 16 cases of panic disorder, where clonazepam was highly prescribed 13 (81.25%) followed by amitriptyline 3 (18.75%), 2 cases of agoraphobia (clonazepam and Mirtazapine were prescribed 1 each), 16 cases generalized anxiety disorder, where opipramol 9 (56.25%) was highly prescribed followed by amitriptyline 4 (25%) and sertraline 3 (18.75%). In case of other anxiety disorder, the majority of SSRIs class drug escitalopram 5 (41.67%) was highly prescribed followed by amitriptyline 3 (25%) and sertraline and clonazepam 2 (16.67%) each. Table 7 summarized the list of drugs prescribed in the subtype of anxiety disorder. Table 8 summarized only SSRIs class of drug sertraline 2 (100%) was prescribed for OCD and related disorder.

Table 9 summarized that only 5 number of adjustment disorder were found in this which benzodiazepine class drug clonazepam was highly prescribed drug 2 (40%) followed by TCAs drugs amitriptyline and opipramol 1 (20%) each and atypical antipsychotic drug risperidone 1 (20%).

Table 10 summarized the percentage of drugs prescribed in the subtype of seizures/personality/dissociative disorder. Out of 25 cases, 14 patients were having seizures disorder, and 11 patients were having dissociative/personality disorder. Anticonvulsant drugs carbamazepine and phenytoin 6 (42.85%) each were highly prescribed followed by sodium valproate and clonazepam 1 (7.14%) each. In dissociative/personality disorder, atypical antipsychotic drug olanzapine 4 (46.36%) was highly prescribed, and atypical antidepressant drug mirtazapine 1 (9.09%) was least prescribed drug.

Table 11 summarized the list of drugs used in the treatment of psychosomatic disorders. Out of 34 psychosomatic disorders, 10 cases were somatic symptoms disorders, and 24 cases were pain disorder. In case of somatic symptoms disorders, amitriptyline 7 (70%) was most frequently prescribed drug followed by opipramol 2 (20%) and escitalopram 1 (10%). In case of pain disorder, 6 different drugs were prescribed, out of which TCAs class drug amitriptyline 10 (41.67%) was most frequently used followed by opipramol 5 (20.83%).

A total number of 16 drugs was prescribed in impulsive suicidal attempt case, out of which (SSRIs) escitalopram 4 (25%) and (atypical antidepressant) mirtazapine 4 (25%) were most frequently prescribed drugs followed by topiramate 3 (18.75%). Table 12 summarized drugs prescribed in the subtype of disruptive, impulse-control and conduct disorder.

Table 3: Prescription pattern of different class of drugs in the study

Drug class	Frequency n (%)
Antidepressants	199 (28.59)
TCAs	58
SSRIs	91
SNRIs	17
Atypical antidepressant	33
Antipsychotics	102 (14.65)
Typical	20
Atypical	82
Mood stabilizers	11 (1.58)
Anticholinergic	50 (7.18)
Benzodiazepines	117 (16.81)
Hypnotics	41
Anxiolytic	30
Anticonvulsant	41
Non-benzodiazepines	05
Anticonvulsants	50 (7.18)
Barbiturates	03 (0.43)
Vitamin supplements	130 (18.67)
Nicotinic antagonist	09 (1.29)
Others	25 (3.59)
Total	696 (100.00)

TCAs: Tricyclic antidepressants drugs, SSRIs: Selective serotonin reuptake inhibitors, SNRIs: Serotonin-norepinephrine reuptake inhibitors

Table 4: Commonly used psychotropic agents in the study

Class of psychotropic drug	Drug name	Number of drugs prescribed n (%)
Antidepressants		
TCAs	Amitriptyline	31 (53.44)
	Opipramol	27 (46.55)
SSRIs	Escitalopram	59 (64.83)
	Sertraline	32 (35.16)
SNRIs	Atomoxetine	17 (100)
Atypical antidepressant	Mirtazapine	33 (100)
Antipsychotics		
Typical	Haloperidol	08 (40)
	Chlorpromazine	01 (5)
	Flupenthixol	11 (55)
Atypical	Olanzapine	47 (57.31)
	Risperidone	22 (26.82)
	Quetiapine	09 (10.97)
	Aripiprazole	02 (2.43)
	Amisulpride	02 (2.43)
Mood stabilizer	Lithium	11 (100)
Benzodiazepine		
Anxiolytics	Chlordiazepoxide	27 (90)
	Alprazolam	03 (10)
	Lorazepam	41 (100)
Hypnotics	Clonazepam	41 (100)
Anticonvulsants	Zolpidem	05 (100)
Non-benzodiazepine	Sodium valproate	27 (54)
Anticonvulsants	Topiramate	08 (16)
	Valporic acid	01 (2)
	Carbamazepine	06 (12)
	Phenytoin	08 (16)
Barbiturates	Phenobarbitone	03 (100)
Anticholinergic	Trihexyphenidyl	50 (100)
	Total	532

TCAs: Tricyclic antidepressants drugs, SSRIs: Selective serotonin reuptake inhibitors, SNRIs: Serotonin-norepinephrine reuptake inhibitors

In case of alcohol dependence syndrome (ADS), the majority of benzodiazepine drug lorazepam 26 (65%) was prescribed followed by chlordiazepoxide 13 (32.5%). In case of ADS and tobacco dependence syndrome (TDS), anticonvulsant drug topiramate 5 (45.45%) was

Table 5: Antidepressant used (%) in subtype of depressive disorder

Subtype of depressive disorder	Medication used		Class of medication
	Drug (n=214)	n (%)	
Depression and BPAD	Amitriptyline	6 (2.80)	TCAs
	Opipramol	12 (5.60)	TCAs
	Escitalopram	38 (17.75)	SSRIs
	Sertraline	17 (7.94)	SSRIs
	Atomoxetine	4 (1.86)	SNRIs
	Mirtazapine	14 (6.54)	Atypical antidepressant
	Haloperidol	4 (1.86)	Typical antipsychotic
	Flupenthixol	5 (2.33)	Typical antipsychotic
	Olanzapine	22 (10.28)	Atypical antipsychotic
	Risperidone	4 (1.86)	Atypical antipsychotic
	Quetiapine	6 (2.80)	Atypical antipsychotic
	Lithium	11 (5.14)	Mood stabilizers
	Clonazepam	17 (7.94)	Benzodiazepine
	Lorazepam	10 (4.67)	Benzodiazepine
	Sodium valproate	18 (8.41)	Anticonvulsant
	Valproic acid	1 (0.46)	Anticonvulsant
	Trihexyphenidyl	25 (11.68)	Anticholinergic
Total		214 (100.00)	

BAPD: Bipolar affective disorder, TCAs: Tricyclic antidepressants drugs, SSRIs: Selective serotonin reuptake inhibitors, SNRIs: Serotonin-norepinephrine reuptake inhibitors

Table 6: Drugs used (%) in subtype of psychiatric disorder

Subtype of psychosis disorder	Medication used		Class of medication
	Drug	n (%)	
Schizophrenia and psychosis (n=86)	Olanzapine	17 (19.76)	Atypical antipsychotic
	Risperidone	16 (18.60)	Atypical antipsychotic
	Quetiapine	3 (3.48)	Atypical antipsychotic
	Flupenthixol	6 (6.97)	Typical antipsychotic
	Haloperidol	3 (3.48)	Typical antipsychotic
	Trihexyphenidyl	19 (22.09)	Anticholinergic
	Lorazepam	5 (5.81)	Benzodiazepine
	Clonazepam	2 (2.32)	Benzodiazepine
	Escitalopram	4 (4.65)	SSRIs
	Sertraline	6 (6.97)	SSRIs
	Atomoxetine	1 (1.16)	SNRIs
	Sodium valproate	3 (3.48)	Anticonvulsant
	Aripiprazole	1 (1.16)	Atypical antipsychotic
	Total		86 (100)
Delusional disorder	Olanzapine	1 (100)	Atypical antipsychotic

SSRIs: Selective serotonin reuptake inhibitors, SNRIs: Serotonin-norepinephrine reuptake inhibitors

Table 7: Drugs used (%) in subtype of anxiety disorder

Subtype of anxiety disorder	Medication used		Class of medication
	Drug	n (%)	
Panic disorder (n=16)	Clonazepam	13 (81.25)	Benzodiazepine
	Amitriptyline	3 (18.75)	TCAs
Agoraphobia (n=2)	Clonazepam	1 (50.0)	Benzodiazepine
	Mirtazapine	1 (50.0)	Atypical antidepressant
GAD (n=16)	Amitriptyline	4 (25.0)	TCAs
	Opipramol	9 (56.25)	TCAs
	Sertraline	3 (18.75)	SSRIs
Other anxiety disorder (n=12)	Escitalopram	5 (41.67)	SSRIs
	Sertraline	2 (16.67)	SSRIs
	Amitriptyline	3 (25.00)	TCAs
	Clonazepam	2 (16.67)	Benzodiazepine
	Total	46	

GAD: Generalized anxiety disorder, TCAs: Tricyclic antidepressants drugs, SSRIs: Selective serotonin reuptake inhibitors

highly prescribed followed by serotonin-norepinephrine reuptake inhibitors (SNRIs) drug atomoxetine 4 (36.36%). Out of 30 cases, TDS and nicotinic dependence syndrome, benzodiazepine drug

lorazepam 15 (50%) were most frequently prescribed followed by chlordiazepoxide 14 (46.67%). Table 13 summarized drugs prescribed in the subtype of substance used and addictive disorder.

Table 14 summarized drugs prescribed in the subtype of child psychiatry disorder. In this study, 4 cases of ADHD were found, and only atomoxetine (SNRIs) was prescribed.

Table 15 summarized that 300 prescriptions were analyzed in this study and total of 696 drugs were prescribed, i.e. 2.32 drugs per prescription. Out of 696 prescribed drugs, only 532 drugs were psychotropic drugs (64.28%), where 498 drugs were administered orally and remaining 34 drugs were administered parenterally. Only 16.91% of psychotropic

drugs were prescribed in generic name and 64.28% these drugs were listed in essential drug list.

Out of 300 prescriptions (Table 16), 24.33% of prescription contains only one drug, and 37%, 24%, 11.67%, and 3% of prescriptions contains 2, 3, 4, and 5 drugs, respectively. In this study, prescriptions containing 5 or more than 5 drugs were considered as polypharmacy 9 (3%).

Table 17 summarized prescribing patterns based on the WHO core drug indicators. Out of 300 prescriptions, only 30% of prescriptions contain <Rs. 100 and 70% of prescriptions contain more than 100 Rs. In this study, 94.33% prescription contains prescription errors.

Table 8: Drugs used (%) in subtype of OCD and related disorder

Subtype of OCD	Medication used		Class of medication
	Drug	n (%)	
OCD (n=2)	Sertraline	2 (100)	SSRIs

OCD: Obsessive-compulsive disorder, SSRIs: Selective serotonin reuptake inhibitors

Table 9: Drugs used (%) in subtype of Trauma and stress-related disorder

Subtype of trauma and stress-related disorder	Medication used		Class of medication
	Drug	n (%)	
Adjustment disorder (n=5)	Clonazepam	2 (40.0)	Benzodiazepine
	Amitriptyline	1 (20.0)	TCAs
	Opipramol	1 (20.0)	TCAs
	Risperidone	1 (20.0)	Atypical antipsychotic
Total	5		

TCAs: Tricyclic antidepressants drugs

Table 10: Drugs used (%) in subtype of seizures/personality/dissociative disorder

Subtype of seizures/personality/dissociative	Medication used		Class of medication
	Drug	n (%)	
Seizures disorder (n=14)	Carbamazepine	6 (42.85)	Anticonvulsant
	Phenytoin	6 (42.85)	Anticonvulsant
	Sodium valproate	1 (7.14)	Anticonvulsant
	Clonazepam	1 (7.14)	Benzodiazepine
Dissociative/personality disorder (n=11)	Olanzapine	4 (46.36)	Atypical antipsychotic
	Trihexyphenidyl	3 (27.27)	Anticholinergic
	Escitalopram	3 (27.27)	SSRIs
	Mirtazapine	1 (9.09)	Atypical antidepressant
	Total	25	

SSRIs: Selective serotonin reuptake inhibitors

Table 11: Drugs used (%) in subtype of psychosomatic medicine

Subtype of psychosomatic medicine	Medication used		Class of medication
	Drug	n (%)	
Somatic symptoms disorders (n=10)	Opipramol	2 (20.00)	TCAs
	Amitriptyline	7 (70.00)	TCAs
	Escitalopram	1 (10.00)	SSRIs
Pain disorder (n=24)	Amitriptyline	10 (41.67)	TCAs
	Opipramol	5 (20.83)	TCAs
	Sertraline	2 (8.33)	SSRIs
	Clonazepam	2 (8.33)	Benzodiazepam
	Mirtazapine	2 (8.33)	Atypical antidepressant
	Sodium valproate	3 (12.5)	Anti-convulsant
	Total	34	

TCAs: Tricyclic antidepressants drugs, SSRIs: Selective serotonin reuptake inhibitors

Table 12: Drugs used (%) in subtype of disruptive, impulse-control and conduct disorder

Subtype of disruptive, impulse-control and conduct disorder	Medication used		Class of medication
	Drug	n (%)	
Impulsive suicidal attempt (n=16)	Olanzapine	1 (6.25)	Atypical antipsychotic
	Clonazepam	1 (6.25)	Benzodiazepine
	Lorazepam	2 (12.5)	Benzodiazepine
	Escitalopram	4 (25.00)	SSRIs
	Mirtazapine	4 (25.00)	Atypical antidepressant
	Atomoxetine	1 (6.25)	SNRIs
	Topiramate	3 (18.75)	Anti-convulsant
	Total	16	

SSRIs: Selective serotonin reuptake inhibitors, SNRIs: Serotonin-norepinephrine reuptake inhibitors

Table 13: Drugs used (%) in subtype of substance used and addictive disorder

Subtype of substance used and addictive disorder	Medication used		Class of medication
	Drug	n (%)	
ADS (n=40)	Chlordiazepoxide	13 (32.5)	Benzodiazepine
	Lorazepam	26 (65.0)	Benzodiazepine
	Haloperidol	1 (2.5)	Typical antipsychotic
ADS and TDS (n=11)	Topiramate	5 (45.45)	Anticonvulsant
	Atomoxetine	4 (36.36)	SNRIs
TDS and NDS (n=30)	Olanzapine	2 (18.18)	Atypical antipsychotic
	Mirtazapine	1 (3.33)	Atypical antidepressant
	Chlordiazepoxide	14 (46.67)	Benzodiazepine
	Lorazepam	15 (50.0)	Benzodiazepine
Total	81		

ADS: Alcohol dependence syndrome, TDS: Tobacco dependence syndrome, NDS: Nicotinic dependence syndrome, SNRIs: Serotonin-norepinephrine reuptake inhibitors

Table 14: Drugs used (%) in subtype of child psychiatry disorder

Subtype of child psychiatry disorder	Medication used		Class of medication
	Drug	n (%)	
ADHD (n=4)	Atomoxetine	4 (100)	SNRIs
	Total	4	

ADHD: Attention deficit hyperactivity disorder, SNRIs: Serotonin-norepinephrine reuptake inhibitors

Table 16: Number of drugs prescribed per prescription (n=300)

Number of drugs prescribed	Number of prescription (%)	Polypharmacy (≥5)
One	73 (24.33)	No
Two	111 (37.00)	No
Three	72 (24.00)	No
Four	35 (11.67)	No
Five	09 (3.00)	Yes

Table 15: Analysis of prescribing indicators

Characteristics	Value±SEM
Total number of prescriptions	300
Total number of drugs encountered	696
Average number of drugs per prescription	2.32±0.78
Total number of psychotropic agents prescribed	532
Total number of non-psychotropic agents prescribed	164
Percentage of psychotropic drugs prescribed by generic name	16.91
Percentage of psychotropic drugs prescribed from essential drug list	64.28
Percentage of patients treated without drugs	0.0
Average consultant time for illness	19±2 min
Number of orally administered drugs	498
Number of parenterally administered drug	34

SEM: Standard error of the mean

Table 17: WHO core drug use prescribing indicators

Indicators	Values±SEM
Average cost of medicine per day	Rs. 27.13±8.54
Average cost of medicine per prescription	Rs. 286.55±20.39
Percentage of prescriptions containing <100 Rs.	30
Percentage of prescriptions containing more than 100 Rs.	70
Percentage of prescription with documentation error	94.33

SEM: Standard error of the mean, WHO: World Health Organization

Out of 300 participants, 252 (84%) were married and remaining 48 (16%) were unmarried. Most of the patients were married at a statistically significant rate in all type of disorder ($p < 0.0001$), findings of these results are supported by Swamy *et al.* reported married (81.11%) followed by single (14.85%) and widow (2.9%) [13]. In another study Grover *et al.* also reported married participants (71.8%) were more common than unmarried single (22%) [11].

Majority of patients were unemployed 156 (52%) followed by self-employed 141 (47%) and employed 3 (1%). Most of the patients were unemployed at a statistically significant rate in all type of disorder ($p = 0.0475$) except for the substance used and addictive disorder, unemployed participants were high in this study as the study was

In our study, most of the age group of 31-40 years (28.6%) were prescribed followed by age group 21-30 (27.33%). The meant similar nature of finding was reported by Banerjee *et al.* that psychiatric disorder is commonly prevalent in patients below 40 years of age [14]. In another study, Grover *et al.* reported patients age in between 20 and 50 years (89.4%) is most common in their study [11]. In our study schizophrenia, anxiety, seizures were most common in 41-50 years patients.

conducted in rural tertiary care hospital. Findings of our study are supported by Grover *et al.* study where 2289 (51.1%) participants were unemployed followed by 2191 (48.9%) participants were employed [11]. As far as employment status of the patient is concerned, except substance use and addictive disorder almost all psychiatric disorders are commonly prevalent in unemployed patients.

In our study illiterate 225 (75%) followed by literate (25%) due to study was conducted in a rural area where majority of participants were farmer, housewives, and non-proper schooling facility. Most of the patient were illiterate at a statistically significant rate ($p=0.0060$) in all type of disorder except for trauma/stress-related disorder where illiterate and literate patient were equal in number.

Out of 300 prescriptions, total numbers of 696 drugs were prescribed. The types and number of drugs prescribed in the study are antidepressants 199 (28.59%), vitamin supplements 130 (18.67%), benzodiazepines 117 (16.81%), antipsychotics 102 (14.65%), anticholinergic 50 (7.18%), mood stabilizers 11 (1.58%), Nicotinic antagonistic 9 (1.59%), barbiturates 3 (0.43%), and others drugs 25 (3.59%). Vitamins supplements were prescribed commonly among ADS and patient getting psychotropic agent due to fulfill thiamine deficiency and inhibit gastric irritation, respectively. Some antidepressants or psychotropic agents may induce gastric irritations.

Out of 696 prescribed drugs, a total number of psychotropic agents prescribed were 532. Among 532 psychotropic agents, 498 (93.61%) drugs were prescribed in tablet dosage form followed by injections 34 (6.39%). Among antidepressants ($n=199$), SSRIs class ($n=91$) of antidepressants were most frequently prescribed followed by TCAs ($n=58$), atypical antidepressants ($n=33$) and SNRIs ($n=17$). This finding was supported by Mishra *et al.* where they reported 58.87% of SSRIs prescribed [15]. Amitriptyline 31 (53.44%) was most commonly prescribed TCAs class antidepressants followed by opipramol 27 (46.55). Among SSRIs class antidepressants, escitalopram 59 (64.83%) was highly prescribed followed by sertraline 32 (35.16%). Flupenthixol 11 (55%) was commonly prescribed typical antipsychotics followed by haloperidol 8 (40%) and 1 (5%). Among all atypical antipsychotics prescribed olanzapine 47 (57.31%) was prescribed commonly followed by risperidone 22 (26.82%). These results were supported by Roopadevi *et al.* study [16]. Lithium was the most common mood stabilizer drug being prescribed 11 (100%). Lorazepam ($n=41$) and clonazepam ($n=41$) were most common benzodiazepines prescribed followed by chlordiazepoxide ($n=27$), zolpidem ($n=5$), and alprazolam ($n=3$). Trihexyphenidyl was only anticholinergic drug which was prescribed.

Out of 300 prescriptions, 73 (24.33%) prescriptions contain only one drug, 111 (37.0%) contains 2 drugs, 72 (24%) contains 3 drugs, 35 (11.67%) contains 4 drugs, and 9 (3%) contains 5 drugs. In this study, prescriptions containing 5 or more than 5 drugs were considered as polypharmacy.

The average number of drugs per prescription was lower (2.32 ± 0.78) than that found in the studies conducted by Mudhaliar *et al.*, where it was reported 2.37 drugs per prescription [10]. In contrast to our results, Swamy *et al.* [13] and Ghosh and Roychaudhury [17] reported 1.85 ± 0.8 and 2.03 drugs per prescriptions. During the study, it was also observed that 156 (52%) prescriptions contain drug combinations. In our setting very, less number of drugs (16.91%) were prescribed by generic names, which is supported by the study conducted in Nigeria, Ghana, Lebanon, and Nepal. In contrast to this study, Mudhaliar *et al.* [10] and Mishra *et al.* [15] reported 99.08% and 99%, respectively, were prescribed in generic form. This study suggested that substitution of branded drug by generic drugs helps in decreasing the overall cost of the drug therapy and treatment cost and is hence recommended. However, there have been concerns in the case of narrow therapeutic

index drugs. As per Thakkar *et al.*, generic substitution can be beneficial, provided adequate quality control is assured [12]. Out of 532 Psychotropic drugs, 64.28% of drugs were prescribed from essential drug list (WHO; 2013), findings of these studies were similar to the study conducted by Mishra *et al.* (44.99%) [15]. The primary purpose of National list of essential medicine is to promote rational use of medicines considering the three important aspects, i.e. cost, safety, and efficacy. Only pharmacotherapy and patient counselling was done during the study. Average psychiatric consultations time was 19 ± 2 min where all patients got at least one drug. Almost all patients sought to get counselling advice about medication and treatment therapy with us. Based on the severity of cases some patients were given injections. During this study out of 532 psychotropic drugs used, 34 (6.39%) of medication were given in injection form.

Some problem based complementary indicators were used to assess drug use in prescription and majority of the prescriptions were incomplete 283 (94.33%), where most of the cases weight and route of administration were not mentioned 185 (61.67%). Even though such errors seem to minor error but might cause harm during overall treatment of patients.

CONCLUSION

Drug utilization is an evolving process. Thus, continuous monitoring of prescription pattern helps to understand changing trends in prescribing pattern over time. Our study was mainly focused on the prescribing pattern of psychotropic agents at psychiatric department of rural tertiary care teaching hospital. Such study provides opportunities for enhancing the quality of mental health care in our society, by providing awareness in rational and cost-effective use of medicine.

AUTHORS CONTRIBUTION

Madan Rayamajhi, Shahinur Islam and Nanjunda N -Principal Investigator who conducted the study.

CONFLICTS OF INTEREST

The authors have no personal, professional, or ethical conflicts of interest in the publication of this study.

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