

## Research Article



## Drug Utilization Pattern of Antipsychotics Among Patients Attending Psychiatry OPD in A Tertiary Care Teaching Hospital: A Cross-Sectional Observational Study

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### ABSTRACT

Antipsychotic medications are the primary therapeutic interventions in the treatment of patients with psychiatric disorders. Prescribing trends of antipsychotics has modified over the decade with accessibility of atypical antipsychotics. Hence continuous studies on contemporary prescribing patterns are needed to provide most upgraded, effective and rational treatment of psychoses. A cross sectional study of patients receiving antipsychotics was carried out in the Psychiatry Out Patients Department (OPD) of K R Hospital, Mysuru for a period of six months. All relevant data of the enrolled patients was collected from various data sources and documented in a suitably designed data collection forms to evaluate and to understand the pattern and extent of medication use by using WHO-CORE indicators and to systematically classify drugs using WHO-ATC system and to represent diagnosed psychiatric disorder according to WHO-ICD 10 version. We incorporated an aggregate of 200 study population. Male preponderance (55%) was observed when compared to females (45%) who attended the psychiatry OPD. The most prevalent psychiatric disorder was F20 (Psychosis/Unspecified psychosis/Schizophrenia/ Chronic Psychosis/ Delusional disorder/ Unspecified psychosis with Depression) comprised 60% of the most prevalent psychiatric disorders in our study population. The average number of antipsychotic per prescription was 1.33±0.46. 90.63% of antipsychotic drugs were prescribed by their generic names. Additionally, 2% of antipsychotic injectables were present in the prescription, 0.34% minimal antibiotic medications were prescribed and no fixed dose combinations were documented. Higher inclination towards atypical antipsychotics was observed than Typical antipsychotics. Olanzapine was the most routinely prescribed antipsychotic followed by Risperidone. Antipsychotic polypharmacy was observed in 21% patients in our study population. The WHO Core Prescribing indications corresponded with the optimal values, suggesting rational drug therapy and thus eradicating probability of irrational prescribing practices. The findings are able to be used as benchmark for the healthcare facilities and as a basis for further follow up of quality of drug use.

**Keywords:** Prescribing pattern, Antipsychotics, DUE.

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### INTRODUCTION

Psychiatric disorders are deleterious, complicated diseases that affect mood, cognition, and behavior and are also known as mental illnesses synonymously.<sup>1</sup> They can be identified by a variety of atypical ways of thinking, perceiving, expressing, behaving, and interacting with others.<sup>2</sup>

According to the World Health Organization's (WHO) Global Burden of Disease Study, psychiatric illnesses are considered to be among the most onerous diseases in the world. They influence people's economic well-being as well as their quality of life.<sup>3</sup>

Psychiatric ailments are responsible for 12% of the disease burden worldwide. By 2020, it is expected that they would account for 15% of all disability-adjusted life-years (DALYs)

lost. Intercontinental the prevalence rates for these illnesses are expected to be around 10% for adult populations. According to many epidemiological research conducted in India, the morbidity rate is about 18-20 per thousand people.<sup>4</sup>

Mental illnesses presented a significant burden to health systems, particularly in low- and middle-income countries, in 2017. They were the second-largest cause of years lived with disability (YLDs) and the sixth-leading cause of disability-adjusted living years (DALYs) worldwide in 2017. India had 197.3 million individuals with mental illness, accounting for 14.3% of the entire population. In India, mental illness was attributed to 47% of total DALYs and was the main cause of YLDs accounting for 14.5% of YLDs.<sup>5</sup>

Psychiatric diseases form a major public health concern, both in terms of the number of people affected and the burden these diseases place on society. Four of the top 10 health problems that contribute to disability-adjusted life years (DALY) are mental disorders.<sup>6</sup>

In India, several epidemiological surveys have been carried out concerning mental and behavioral illnesses and prevalence rates vary from 9.5 to 370 per 1000 inhabitants.<sup>7</sup>



Psychopharmacology is a fastest snowballing area of subject that is demanding standard psychiatric treatment approaches, and research is always looking for new and better medications to treat psychiatric diseases. Psychiatrists are constantly exposed to new medications that are said to be more effective in this way.<sup>8</sup> Pharmacoepidemiological researches are imperative to determine potentially unproven or unpredictable expansions of psychotropic drug indications.<sup>9</sup> Psychotropic medications have become incredibly valuable in millions of people's daily lives during the previous three decades.<sup>10</sup>

Antipsychotic medications, also referred as Neuroleptics are adopted since 1950s in the clinical setting for the management of psychiatric ailments such as psychoses, schizophrenia, schizoaffective and bipolar disorders. There seem to be no substantial changes in this therapeutic class except for the recent addition of "atypical" antipsychotics<sup>11,12</sup> Antipsychotic medicine prescribing patterns have changed around the globe, with newer atypical antipsychotics having largely supplanted classic antipsychotics (typical antipsychotics). These newer meds, such as risperidone and olanzapine, have efficacy that is at least similar to that of older treatments like chlorpromazine and haloperidol, while having a small number of side effects.<sup>9,13</sup> According to studies conducted, antipsychotic drug prescriptions to treat psychiatric illness have proliferated in many regions around the world during the last two decades<sup>14,15</sup>

Antipsychotic polypharmacy is the simultaneous apportioning of two or more antipsychotics in the pharmacotherapy of patients with psychiatric diseases.<sup>16</sup> The prevalence rates of Typical antipsychotic polypharmacy were outlined to be 10%-69%. Countable investigations from regions such as UK and US have concluded atypical antipsychotic polypharmacy to be 13%-68%.<sup>17</sup>

Antipsychotics are ascribed to numerous negative consequences such as Extra pyramidal side effects, sedation, weight gain, metabolic interruptions, sexual impairments, urinary and gastrointestinal dysfunctions, Menstrual irregularities, and galactorrhea<sup>18</sup> Side effects are pharmacologically significant since they can cause distress, diminish quality of life, be stereotyping, and lead to antipsychotic medication nonadherence, which can cause a relapse of the underlying psychiatric diagnosis. Consequently, some adverse effects can result in additional physical morbidity and mortality. Side effects must be monitored in a systematic manner and certain rating scales are designed to evaluate specified antipsychotic side effects.<sup>19</sup>

The Glasgow antipsychotic side effect scale is a validated multi-disciplined self-reported questionnaire for determining the prevalence of antipsychotic side effects and their severity. It has numerous significant advantages over other self-reported questionnaires because of its

brevity, global various domain coverage, accessibility, and self-explanatory layman language.<sup>20</sup>

Although pre-marketing clinical studies are anticipated to put forward the majority of evidence for therapeutic options, it is essential to carry out a pharmacoepidemiological investigation, such as a study on drug utilization patterns over time.<sup>21</sup>

Drug utilization studies have long been recognized as effective and adaptable techniques for determining the overall quality of prescribing practices and can impart comprehensive information on drug usage criteria in the overall population.<sup>9,22</sup>

Drug utilization studies promotes rational drug prescribing, understanding prevalence of drug usage in the population and investigates whether a specific intervention impacts drug use in the community by studying drug utilization trends.<sup>23</sup>

The ATC- (Anatomical Therapeutic Classification) system classifies active ingredients of medications according to the organ or system on which they interact as well as their therapeutic, pharmacological, and chemical attributes. It is a tool for drug utilization monitoring and research.<sup>24</sup>

WHO core and complementary indicators present as quintessential tools to understand prescribing practices, and key elements for patient care.<sup>25</sup>

Therefore, considering the above background the authors carried out this research as a cross-sectional observational study to enumerate the utilization pattern of antipsychotic drugs in psychiatry disorders (Classified according to ICD 10 Criterion) methodically by incorporating WHO Core Indicators, WHO ATC guidelines. Further quantifying the side effects by Glasgow antipsychotic side effect scale designed at the OPD psychiatry department of a tertiary care teaching hospital in Mysuru, Karnataka.

## METHODOLOGY

**Study Site:** The study was carried out at Krishna Rajendra hospital (KR), Irvin Road, Mysuru. It is a tertiary referral care center and teaching hospital attached to Mysore Medical College and Research center in Mysuru, Karnataka, India.

**Study Design:** Cross-Sectional observational study

**Study period:** 6 Months

**Department Selected for Study:** The study was conducted in the Psychiatry department

**Ethical approval for the study:** Ethical clearance for this study was obtained from the Institutional Ethics Committee, Mysore Medical College & Research Institute (Ref no CR-366/03/2021)

**Study population- Sample size:**

One Proportions Formula is used for calculating the sample size. It is as follows:



$$N = Z^2 PQ/d^2$$

Where N is the Required sample size

Z is 1.96 for 95% confidence

P is Prevalence (50%)

Q is 1-P

d is the Maximum Allowable Error (7%)

From the above equation, the sample size came to be 196 and was rounded off to 200.

Therefore, a Sample size (Study population) of 200 will be incorporated into the study.

#### Sources for data collection:

All the relevant and necessary data will be collected from

- Patients' case records
- Patient or patient's caretaker(s) interview
- Prescriptions of patients
- Interviewing healthcare professionals
- Any other relevant source(s)

#### Experimental design:

The study involved the following steps:

**Step 1:** Preparation of Informed Consent form

**Step 2:** Preparation of Data Collection Form

**Step 3:** Patient enrollment was based on inclusion and exclusion criteria

**Step 4:** Data Collection

**Step 5:** Statistical analysis was performed by using Microsoft Office Excel 2016

**Step 6:** Interpretation

### RESULTS

An aggregate of 200 study participants with a diagnosis of psychiatric disorders and complying with our inclusion criterion from Psychiatry was analyzed.

#### Characteristics of Study population

The following Table 1 thoroughly depicts the Socio-demographic profile of the study population.

##### 1. Gender

A larger number of patients in the study was 55% (n=110) males when compared to Females 45% (n=90). Therefore, a pattern of male predominance was observed in our study.

##### 2. Age

The average age of patients was found to be 38.45. Majority of the patients belonged to the 26-35 age group (n=71;35.5%) represented the maximum users with male preponderance, followed by 36-45 (n=47;23.5%) and 46-55

(n=35;17.5 %). The maximum age of patients in the study population was 65 years and the minimum age was 18 year

**Table 1:** Socio-demographic profile of study population

Demographic Data	Number of Patients	Percentage
<b>Gender</b>		
Males	110	55%
Females	90	45%
<b>Age (in years)</b>		
18-25	28	14%
26-35	71	35.5%
36-45	47	23.5%
46-55	35	17.5%
56-65	19	9.5%
<b>Education</b>		
Illiterate	69	34.5%
Primary & High School	98	49%
Intermediate	23	11.5%
Graduation	07	3.5%
Post-Graduation	03	1.5%
<b>Occupation</b>		
Unemployed	112	56%
Employed	85	42.5%
Others	3	1.5%
<b>Geographical Area</b>		
Rural	115	57.5%
Urban	85	42.5%
<b>Religion</b>		
Muslim	29	14.5%
Hindu	163	81.5%
Christian	08	4%
<b>Socioeconomic Status</b>		
BPL	188	94%
APL	12	6%

##### 3. Geographical area

On reviewing their geographical area most of the study participants resided in rural habitats (n=115;57.5%) when compared to urban habitats (n=85;42.5 %).

##### 4. Literacy status

The level of Education description of the study population is primary and high school around (n=98;49%), Illiterate (n=69;34.5%), Intermediate (n=23;11.5%), Graduation (n=7;3.5%) and least Post graduation (n=3;1.5%)

##### 5. Socioeconomic status:

The socioeconomic status of majority study population is Low- income group (n=110;55%), proceeded by Low Middle-income group (n=69;34.5%), followed by Middle Income group (n=9;4.5%), accompanied by High middle



income group (n=7; 3.5%),) and least was high income group (n=5; 2.5 %).

#### 6. Occupational status:

The occupational status of the study participants included is most of them were unemployed (n=112; 56%), proceeded by were Employed (n=85;42.5%), and others like students, retired constituted (n=3; 1.5%).

#### The pattern of psychiatric diagnosis:

Recategorizing patients by the morbidity pattern of psychiatric diseases it was reviewed that Psychosis (n= 120; 60%) was the most prevalent illness, followed by Bipolar affective disorder (n=30; 15%), Seizure disorder with psychosis (n=21; 10.5%) and least was Alcohol-induced disorder (n=1; 0.5%). Table 2 outlines the pattern of psychiatric disease with their ICD Codes.

**Table 2:** ICD-10 Code of Psychiatric condition with frequency

Sl.No	ICD Code	Psychiatric Disease`	No. of Patients	Percentage
1	F-20	Psychosis/ Unspecified psychosis/ Schizophrenia/ Chronic psychosis/ Delusional disorder/Persistent delusion disorder/ Unspecified psychosis with Depression	120	60%
2	F-31	BPAD/ BPAD with Depression/ Mania	30	15%
3	G-40	Seizure disorder/ Seizure disorder with Psychosis	21	10.5%
4	F-70	MR with Seizure disorder/ MR with Behavioural problems/ MR with psychosis	15	7.5%
5	F-32	Depression/ Dysthymia/ Catatonia	12	6%
6	F-10	Alcohol induce disorder	1	0.5%
7	F-40	Anxiety Disorder	1	0.5%

#### Analysis of WHO Core Indicators

Among 200 patients evaluated, a total of 584 drugs were prescribed. Prescriptions were analyzed by WHO Prescribing Indicators and it was observed that an Average number of drugs per prescription was  $2.92 \pm 1.27$ . Average number of Antipsychotics prescribed per prescription was  $1.33 \pm 0.46$ . The number of antipsychotic drugs prescribed by generic name was 90.63%. The percentage of antibiotics encountered in the prescription was 0.34%. Drugs prescribed from EDL List were 42.63%. Antipsychotic drugs prescribed from the EDL list were found to be 16.78%. Table 3 Summarizes the WHO Core Indicators i.e. Drug usage pattern in psychiatric illness.

#### The pattern of Antipsychotics prescribed

A total of n=267; 45.71% of antipsychotic drugs were prescribed in the study population. Atypical antipsychotics (n= 255; 95.5%) were routinely prescribed rather than Typical antipsychotics (n= 12; 4.49%). Table 4 encapsulates the prescribing pattern of antipsychotics with their ATC Codes.

#### Side effects due to antipsychotics

Figure 1 illustrates the side effects quantified by using Glasgow Antipsychotic Side Effect Scale in the study population. Most patients complained of sleepiness during the day (n= 78;22.9 %) followed by fatigue (n=55;16.17%)

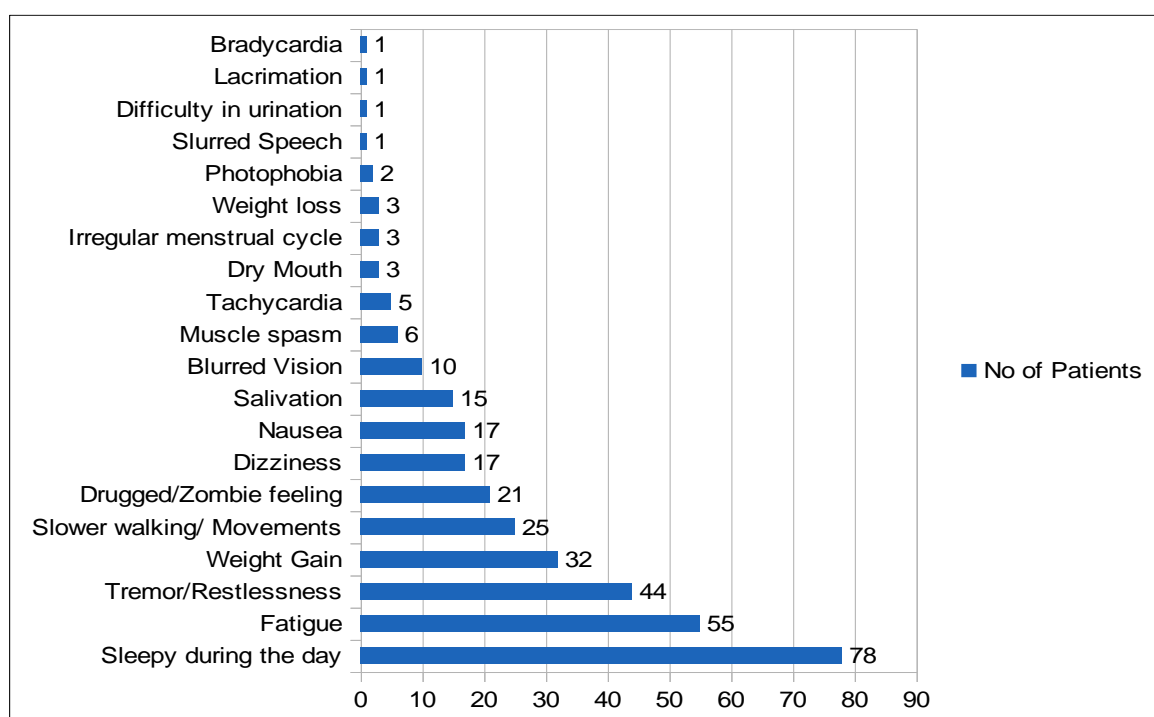
and least was bradycardia, lacrimation, decreased sleep and slurred speech (n= 1;0.29%).

**Table 3:** WHO Core indicators in psychiatry OPD

WHO Drug Core indicator	Result
The average number of drugs per prescription	$2.92 \pm 1.27$
The average number of the antipsychotic drug per prescription	$1.33 \pm 0.46$
Percentage of antipsychotic drugs prescribed	45.71%
Percentage of antipsychotic injectables prescribed	2%
Percentage of the antipsychotic's drugs prescribed by generic name	90.63%
Percentage of antibiotics encounter in the prescription	0.34%
Percentage of the drug prescribed from EDL	90%
Percentage of the antipsychotic drug prescribed from EDL	16.78%

**Table 4:** Prescribing pattern of antipsychotics with their ATC Codes

Class of drugs Antipsychotics (n=267)	Number of drugs	Percentage of drugs	ATC Codes
<u>Typical Antipsychotics</u>	<u>12</u>	<u>4.49%</u>	
Chlorpromazine	5	1.87%	N05AA01
Trifluoperazine	3	1.12%	N05AB06
Fluphenazine	4	1.49%	N05AB02
<u>Atypical Antipsychotics</u>	<u>255</u>	<u>95.5%</u>	
Aripiprazole	5	1.87%	N05AX12
Clozapine	5	1.87%	N05AH02
Risperidone	93	34.83%	N05AX08
Olanzapine	149	55.8%	N05AH03
Quetiapine	3	1.12%	N05AH04



**Figure 1:** Side effects due to antipsychotics

**The pattern of antipsychotic polypharmacy**

Antipsychotic polypharmacy was observed in 42 (21%) patients in the study population. The prevalence was more in Males (n=29; 69%) when contrasted with Females (n=13; 30.95%) counterparts.

**DISCUSSION**

**Characteristics of study population**

The present study includes a total of 200 study population, out of which 55% were males and 45% were females. The male preponderance in our study was also found in similar studies conducted by Shaifali I et.al., reporting 57 % males and 43% females, and Rode SB et.al. reported 52.31% males and 47.69% females respectively. <sup>26,27</sup> This signifies that males take care of financial, social, and familial

responsibilities that may supplement a greater number of incidences of psychiatric diseases. Additionally, this disparity is most likely due to the selected population's social, cultural, and educational backgrounds, as well as the male-female ratio. <sup>28</sup>

It was observed from our study that the majority of the patients around 76.5% attending the Psychiatry OPD were between the age category of 26-55 years which was analogous to the studies conducted by Piparva KG et.al., that reported 78% of psychiatric illness were noticed in the age category of 24-54 years.<sup>29</sup> And also by Bodke P et. al., concluded that 88% of psychiatric ailments were observed in the age group of 20-59 years. <sup>14</sup> This implies that the reproductive age category, the transformation from youth through adolescence to adulthood, professional





development as well as other socioeconomic responsibilities raise the risk of the majority of mental ailments. It is also possible that the reduction in psychiatric disease beyond this age is related to the settling of all these life's turmoil<sup>28</sup>

### The pattern of psychiatric diagnosis

The findings of our study concluded that ICD –10 code F20 for (Psychosis/Unspecified psychosis/Schizophrenia/Chronic Psychosis/ Delusional disorder/ Unspecified psychosis with Depression) comprised 60% of the most prevalent psychiatric disorders in our study population. This was similar to the studies conducted by Shamkumar CA et.al., that inferred Psychoses as the most prevailing psychiatric diagnosis.<sup>30</sup> and also by R., B et.al., that concluded that Schizophrenia and other types of psychosis contributed, a major part to psychiatric morbidity.<sup>31</sup>

### Analysis of WHO CORE Indicators

WHO drug use core indicators are predominantly used to determine the drug use patterns/practices in the healthcare settings. They are categorized into prescribing, patient care, and facility-specific indicators.<sup>32</sup>

The average number of psychotropic drugs per prescription in our study was found to be 2.92±1.27, which was found in similar studies, where it ranged from 2.3 to 3 drugs per prescription.<sup>39</sup> Furthermore, Piparva KG et.al., in their study also interpreted an average number of drugs per prescription as 2.96 which implies similarity to our study interpretation.<sup>29</sup> A predominantly higher average number of drugs prescribed per patient exceeds the WHO recommendation conveys polypharmacy as a major concern that raises the likelihood of adverse effects and interactions. There are suggestions that polypharmacy is becoming more prevalent when healthcare professionals are treating various ailments at the same time and are managing severe co-morbidities and the need for further therapeutic compounds.<sup>33,34</sup>

Our study assessed that the average number of antipsychotics per prescription was found to be 1.33±0.46. These results are approximately similar to the study conducted by R., B., et. al., where the average number of antipsychotics per prescription was 1.38<sup>31</sup>

In our study, 90.63% of antipsychotic drugs were prescribed by their generic names, which is less than the WHO recommendation of 100%. It is well recognized that substituting generic medicines for brand-name pharmaceuticals lowers the overall cost of therapy which is important in developing nations like India where most of our patients have poor socioeconomic profiles and is so advised. Generic replacement might be advantageous if proper quality control is ensured.<sup>31</sup>

Additionally, 2% of antipsychotic injectables were present in the prescription, 0.34% of minimal antibiotic medications were prescribed and no fixed-dose combinations were documented. Such conclusions appear to demonstrate the

prudent use of medications and recommend rational prescribing practices.

### The pattern of antipsychotics prescribed

In our study, atypical antipsychotics were more routinely prescribed (95.5%) than typical antipsychotics (4.4%). This implies that there is a higher inclination towards atypical antipsychotics. Atypical drugs are recommended as preferable medicines due to their high effectiveness, lower incidence of extrapyramidal side effects, reduced negative symptoms, cognitive impairment, and ability to bring response in patients who have failed to respond to traditional antipsychotics. The current research findings on the preferential usage of atypical antipsychotics are consistent with those of other investigators like Shaifali I et.al., where the use of Atypical antipsychotics (89%) was observed as compared to typical antipsychotics (11%).<sup>26</sup> And also similar to the findings by Shah et.al., wherein Atypical antipsychotic drugs (94.03%) were preferred over typical antipsychotic drugs (5.97%).<sup>35</sup>

In the present study, Olanzapine (55.80%) was the most commonly used antipsychotic followed by risperidone (34.83%), Aripiprazole (1.87%), Clozapine (1.87%), Chlorpromazine (1.87%). Other less common antipsychotics utilized were Fluphenazine (1.49%), Trifluoperazine (1.12%), Quetiapine (1.12%). This was comparable to the research conducted by Patron C et.al., that interpreted the most frequently antipsychotics were as follows Olanzapine (478), Clozapine (354), Risperidone (307), Sulpiride (202), Quetiapine (99), Amisulpride (59) and Sertindole (21).<sup>36</sup> And also by Ghosh S et.al., the most commonly prescribed atypical antipsychotic was Olanzapine (77.06%) followed by Risperidone (8.26%) and Quetiapine (1.83%).<sup>37</sup>

### Quantifying side effects due to antipsychotics

The most generally observed side effects due to antipsychotics in our study were Sleepiness (n=78; 22.9%) and the least were Bradycardia, Lacrimation, Difficulty in urination, and Slurred speech which accounted for (n=1; 0.29%).

Side effects are significant because they can reduce the quality of life, create stigma, raise morbidity and mortality, and contribute to poor drug adherence, which can lead to higher recurrence rates. Knowledge of the relative risk of side effects assists clinicians and patients in making rational Prescription decisions and also reduces their burden. It is significant to mention that these relative risks are estimates based on populations treated with each medicine; individuals' susceptibility to any side effect may differ considerably.<sup>18</sup>

### The pattern of antipsychotic polypharmacy

Antipsychotic polypharmacy was observed in 21% of patients in our study population. The findings can be comparable with Atal S et.al., which reported 32% of Antipsychotic Polypharmacy.<sup>34</sup> Several studies from the United Kingdom and the United States have reported antipsychotic polypharmacy to be ranging between 13%-



68%.<sup>17</sup> With the proper clinical recommendation and the help of standard guidelines and protocols, polypharmacy in psychiatry can be safely reduced.<sup>38</sup>

## CONCLUSION

Drug prescribing pattern research imparts a standard guideline about the effect of varying interventions on prescribing the referred drugs. Psychiatric disorders contribute to a major public health concern regardless of the fact that public health statistics continue to disparage it. Antipsychotic drugs are a class of psychotropic medications that are considered revolutionary and utilized in the pharmacotherapy of psychiatric ailments. Our study concluded that atypical antipsychotics are prescribed more frequently than typical antipsychotics. The reason is decreased prevalence of Extrapyramidal-Endocrine side effects and efficacy profiles than typical antipsychotics. Olanzapine was most routinely used atypical antipsychotic followed by Risperidone. Antipsychotic polypharmacy was observed due to the chronicity of mental illness. The WHO Core Prescribing indicators corresponded with the optimal values, suggesting rational drug therapy and thus eradicating the probability of irrational prescribing practices. Additionally, Glasgow antipsychotic side effects scale assisted in quantifying the possible side effects.

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