



Research Paper

Drug prescribing pattern of antidepressant drugs among patients in a tertiary care psychiatry out patient department during post COVID-19 pandemic era: A prospective, observational and descriptive study.

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ABSTRACT:

Background:The emergence of the novel coronavirus sparked a global health crisis, reshaping conventional medical practices across various disciplines. Mental health challenges following the pandemic stemmed from ordinary individuals experiencing extraordinary circumstances, leading to a spectrum of issues including anxiety, depression, sleep disturbances, and substance misuse. **Objective:**The primary objective of the study was to evaluate the rationality of drug prescribing pattern of antidepressant drugs among patients attending tertiary care psychiatry out-patient department during post COVID-19 era. **Methods:**Conducted in a tertiary care teaching hospital after obtaining ethical approval, encompassing 100 prescriptions containing at least one antidepressant drug prescribed to patients with newly diagnosed depression. Participants underwent a structured questionnaire covering socio-demographic profiles and antidepressant prescribing pattern based on WHO Prescribing Indicators. The data was tabulated in mean \pm SD/SEM and n(%) for continuous and descriptive data respectively. **Results:**Findings revealed that a majority of patients, particularly from rural backgrounds (30-49 years old, predominantly married females with higher secondary or secondary education), commonly presented with post-COVID depressive disorder. Notably, housewives and employees were significantly affected. Antidepressants, notably Sertraline and Paroxetine from the SSRI class, were the most prescribed drugs (39.71%). However, limitations included a short timeframe due to pandemic-related OPD closures, a small sample undersampling severely affected groups (e.g., frontline healthcare workers, individuals in intensive care), and a sampling bias due to COVID-related restrictions. **Conclusions:**The COVID-19 crisis worsened mental health disparities, leading to a surge in antidepressant prescriptions. However, the study found flaws in prescribing practices, emphasizing the need for interventions to ensure sensible antidepressant use. Addressing these issues can improve care practices during the post-pandemic's ongoing challenges.

KEYWORDS: post COVID-19 era, post-pandemic, antidepressant prescriptions, sertraline, paroxetine

Received 12 July, 2024; Revised 24 July, 2024; Accepted 26 July, 2024 © The author(s) 2024.

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I. INTRODUCTION

In several medical fields, the new coronavirus outbreak prompted a swift change of standard clinical methods due to a worldwide health emergency. Interstitial pneumonia, the hallmark symptom of COVID-19, is a systemic infection that may affect several organs and functions. It causes severe respiratory distress and necessitates intense life support [1]. There are notable and varying psychological effects of this pandemic on our society as a whole. After the COVID-19 epidemic, "ordinary" people were put in "extraordinary" settings, which led to mental health problems. There are many other ways that the condition manifests itself, such as emotional problems like worry and sadness, physiological issues like disturbed sleep and appetite, serious mental illness, and drug abuse [2]. Apart from all this there are many social and mental health problems that have emerged as a cause of disturbed mental health status be it job losses, economical slowness, home isolation and above all fear and anxiety. Such never-ending list creates a vicious cycle of anxiety and distress.

Numerous Indian studies have revealed that between 17 and 46 percent of patients who visit basic health centers experience common mental disorders and amongst that depression is the commonest disorder (63.6%). In subjects with one or more chronic physical illnesses, co-morbid depression was present in nearly 9.3%-23.0% of cases [3]. According to Arvind BA et al.'s 2019 estimate, the prevalence of depressive episodes worldwide ranges from 3.2% to 4.7%, and by 2030, unipolar depression is expected to rank second in terms of its contribution to the global disease burden [4].

The main medical uses for antidepressants (AD) include the treatment of anxiety and depressive disorders. On the other hand, this class of medications is also used to treat aggression, eating disorders, enuresis, sexual dysfunction, and some personality disorders. In recent years, worldwide changes have occurred in the way antidepressants are prescribed, SSRIs being talk of the town nowadays [5].

The World Health Organization (WHO) defines “drug utilization as the marketing, distribution, prescription and the use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences”. With the implementation of rational prescribing practices around the world over the years, antidepressant prescribing patterns have undergone a revolution. As a result, traditional medications such as mono-amine oxidase inhibitors (MAOIs) and tricyclic antidepressants (TCAs) have been progressively superseded by selective serotonin reuptake inhibitors (SSRIs), serotonin norepinephrine reuptake inhibitors (SNRIs), and novel antidepressants. Periodically assessing prescribing patterns is necessary to improve therapeutic efficacy, reduce side effects, and give prescribers feedback [6].

Besides this many factors are likely to have a psychological impact on society & to best of our knowledge while retrieving review of literature, we could only find a few studies that too from western world evaluating drug utilization pattern of antidepressant drugs amidst COVID-19 pandemic. Though currently, many studies are ongoing in this direction but to the best of our knowledge, we failed to cite any such study being done from our region. Further, the present-day study is planned so that the recommendation based on said research shall prove of immense utility to healthcare provider with a view to plan health strategies not only for general public but for healthcare providers also who are likely to be affected psychosomatically during this pandemic. Hence, the current trial has been undertaken to evaluate the drug utilization trend of antidepressant drugs among such patients especially during a pandemic.

II. MATERIALS AND METHODS

The present prospective, observational & descriptive study after approval by Institutional Ethics Committee, Government Medical College & Hospital, Jammu was carried out in compliance with the norms of Good Clinical Practice in the Department of Pharmacology at Government Medical College and Hospital, Jammu, in partnership with the Department of Psychiatry. An informed written consent was acquired either from all the participants or their attendants before commencement of the study.

Participants were explained about procedure and purpose of the study in a vernacular language. Patients of either gender belonging to adolescent & adult age groups attending Psychiatry Out Patient Department of Government Medical College & Hospital, Jammu were randomly enrolled in this survey. Participants were subjected to a pre-structured pre-standardized questionnaire consisting of two parts pertaining to socio-demographic profile (gender, age, residence, occupation, and marital status, socio-economic status and education) & pattern of antidepressant drugs usage data based on WHO Core Prescribing Indicators. Evaluation parameters were then assessed by using HAM-scale. Confidentiality was maintained in all regards.

Inclusion criteria-Patients of either gender belonging to adolescent age group (10-19 yrs of age), & adult age group (<60 years of age), suffering from various mental health issues & put on antidepressant drugs for the first time; follow-up patients but encountered first time by the investigator; patient prescribed at least one antidepressant drug in OPD prescription form.

Exclusion criteria-Severe suicidal depression & patient opting for ECT / hospitalization; patients not able to complete questionnaire process; patients lost to follow-ups; follow-up patients encountered previously on first visit; in-patients of psychiatry department.

A hundred (100) prescriptions containing atleast one antidepressant drug were assessed as per WHO core prescribing indicators. Data thus collected was tabulated and evaluated with Microsoft Office Excel.

III. RESULTS

Out of the total 100 patients analyzed, 56 (56%) were females and 44 (44%) were males belonging to the mean age group of 38.77±10.81 years. Majority were married (73%) and dwelled in rural background (61%), with lower socio-economic status (81%). More than half of the subjects (66%) had a higher level of education. In terms of employment status, a significant proportion (57%) were non-working and majority of patients (82%) enrolled in our survey were Hindus (**Table 1**).

Table 1: Socio-demographic profile of patients [No. of patient prescriptions studied (n)=100] (*Source: original)

<i>Parameter</i>	<i>All (n=100)</i>	<i>Females (n=56)</i>	<i>Males (n=44)</i>
Age (in years)	38.77±10.81	39.12±9.77	38.31±12.09
Residence (n%)			
<i>Rural</i>	61 (61%)	35 (35%)	26 (26%)
<i>Urban</i>	39 (39%)	21 (21%)	18 (18%)
Religion (n%)			
<i>Hinduism</i>	82 (82%)	48 (48%)	34 (34%)
<i>Muslim</i>	13 (13%)	5 (5%)	8 (8%)
<i>Others</i>	5 (5%)	3 (3%)	2 (2%)
Marital Status (n%)			
<i>Married</i>	73 (73%)	42 (42%)	31 (31%)
<i>Unmarried</i>	13 (13%)	1 (1%)	12 (12%)
<i>Others</i>	14 (14%)	13 (13%)	1 (1%)
Occupation (n%)			
<i>Non-working</i>	57 (57%)	45 (45%)	12 (12%)
<i>Working</i>	43 (43%)	11 (11%)	32 (32%)
Education (n%)			
<i>≥High school</i>	66 (66%)	32 (32%)	34 (34%)
<i><High school</i>	23 (23%)	16 (16%)	7 (7%)
<i>Illiterate</i>	11 (11%)	8 (8%)	3 (3%)
Socio-economic status (n%)			
<i><10,000</i>	81 (81%)	52 (52%)	29 (29%)
<i>≥10,000</i>	19 (19%)	4 (4%)	15 (15%)

Psychiatric morbidity pattern of study population

In study population, most common diagnosis encountered was of post-COVID depressive disorder (67%), followed by mixed anxiety and depression (10%) (**Fig. 1**).

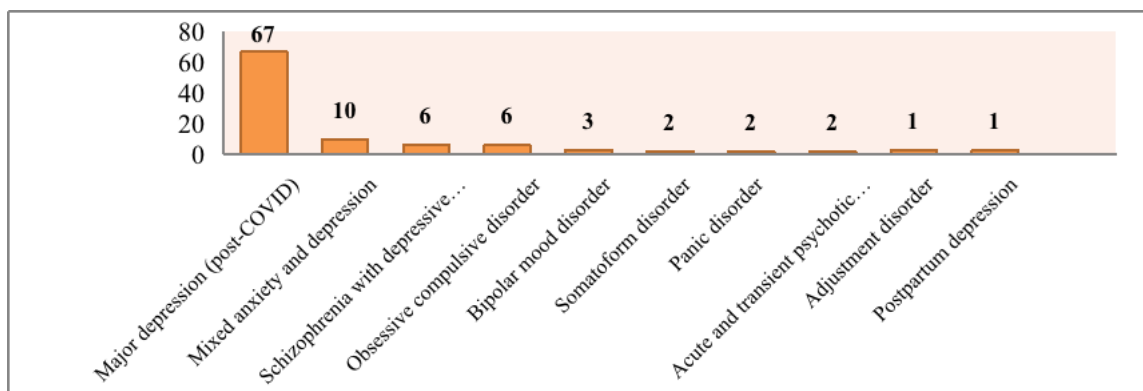


Fig. 1: Psychiatric morbidity pattern of study population [No. of patient prescriptions studied (n)=100] (*Source: original)

Sex-wise distribution of psychiatric morbidity pattern among the enrolled subjects highlighted an overall female preponderance (56%), with 55.22% (out of the total 67% cases afflicted) of them suffering from post-COVID major depression. Similar gender inclination was seen more towards females in cases of schizophrenia with depressive features (66.67%), bipolar mood and somatoform disorders, and postpartum depression (100% in each). However, a few of these psychiatric disorders projected male dominance as in obsessive compulsive disorder (66.67%), and adjustment disorder (100%).

Prescribing indicators There were 272 medications in all throughout 100 prescriptions, with an average of 2.7 ± 0.8 drugs per prescription. 57.72% prescriptions contained drugs prescribed by their generic names. None of the patient was prescribed either antibiotic or injection, and only 25% of the drugs prescribed were from WHO Essential Medicine List as depicted in **Table 2**.

Table 2: Assessment of prescribing pattern as per selected WHO drug use indicators [7]

The WHO drug use indicators	Number (%)	WHO reference value
Overall quantity of prescriptions examined	100	-
Overall quantity of prescription medications	272	-
Count of medications per prescription-		
One	2 (2%)	-
Two	41 (41%)	-
Three	42 (42%)	-
Four	14 (14%)	-
Five	1 (1%)	-
Average quantity of medicines used in each interaction	2.7 ± 0.8	1.6%-1.8%
Proportion of medications prescribed by generic name (n=157)	57.72%	100%
Percentage of drug encounter with antibiotics	NIL	20.0%-26.8%
Percentage of drug encounter with injection	NIL	13.4%-24.1%
Proportion of prescription medications from the WHO Essential Medicine List	25%	100%
Percentage of FDCs	5.15%	-
Percentage of prescriptions written in BLOCK letters	87%	-

Patient care indicators In 100 encounters, the average consultation time taken by the consultant was 2.55 ± 0.51 min. (WHO reference value = ≥ 30 min.) Nearly 3/5th of the subjects (62%) had a fair knowledge of the drug dosage prescribed to them, that is much less than the WHO reference value of 100%.

Facility indicators No essential drug list was available in health facility of study area.

Overall distribution of drugs prescribed in Psychiatry OPD during COVID-19 era: Out of the total 272 drugs prescribed to our study subjects, approximately 39.71% (108) received antidepressants, followed nearly

by 106 anxiolytics (38.97%), while antipsychotics contributed 15.44% (42), anticonvulsants 2.57% (7), and multivitamins 1.47% (4). Least prescribed medications (0.37%) were lithium, analgesics and propulsives. Sertraline from the SSRI class of antidepressants was the most highly used antidepressant (43.52%) followed by Paroxetine (31.48%) and Escitalopram (12.96%) again both belonging to the same class of antidepressants. Nortriptyline accounted for 4.63%, while Opipramol and Desvenlafaxine constituted 2.78% and 1.85% of the prescribed antidepressants respectively. Least prescribed were Clomipramine and Mirtazapine, each accounting for 0.93%.

While conducting age-trend analysis, most of the antidepressant drugs were prescribed to patients of age group between 30-39 years (34.26%), followed by age group 40-49 years (29.63%), whereas least were prescribed to younger age group of 10-19 years (2.78%). Paroxetine (38.24%) and Sertraline (34.04%) were the most commonly prescribed antidepressant drugs in the age group 30-39 years. Opipramol (66.67%) and Nortriptyline (60%) were popularly prescribed in the age group 40-49 years, while Mirtazapine (100%) and Escitalopram (28.57%) were prescribed commonly in the age group 50-59 years.

Nearly half of the total antidepressant drugs prescribed were received by housewives (46.29%), followed by employees (29.63%) and least (1.85%) being prescribed among farmers and students. Among housewives, the study even revealed a higher individual proportion of each of the antidepressant drug prescribed.

Table 3: Mean daily dose of antidepressants (*Source: original)

Antidepressants	No. of prescriptions	Mean dose (mg)
Sertraline		
*50 mg *100 mg	47	89.36±20.68
Paroxetine		
*12.5 mg *25 mg	34	18.75±6.34
Escitalopram		
*5 mg *10 mg *20 mg	14	13.93±5.61
Nortriptyline		
*10 mg *25 mg	5	16±8.22
Opipramol		
*50 mg	3	50±0
Desvenlafaxine		
*50 mg *100 mg	2	75±35.35
Fluvoxamine		
*100 mg	1	100±0
Clomipramine		
*75 mg	1	75±0
Mirtazapine		
*15 mg	1	15±0

Table 4: Antidepressants coded with Anatomical Therapeutic Chemical (ATC) with Defined Daily Dose (DDD) classification (*Source: original)

N06A Antidepressants					
ATC code	Drug name	Class of drug	DDD (Defined Daily Dose)	PDD (Prescribed Daily Dose)	PDD/DDD
N06AB06	Sertraline	SSRI	50	89.36	1.79
N06AB05	Paroxetine	SSRI	20	18.75	0.94
N06AB10	Escitalopram	SSRI	10	13.93	1.39
N06AA10	Nortriptyline	Non-selective monoamine reuptake inhibitor	75	16	0.21
N06AA05	Opipramol	Sigma receptor agonist	0.15	50	333.33
N06AX23	Desvenlafaxine	SNRI	50	75	1.5
N06AB08	Fluvoxamine	SSRI	0.1	100	1000
N06AA04	Clomipramine	TCA	0.1	75	750
N06AX11	Mirtazapine	Atypical antidepressant	30	15	0.5

Tables 3 and 4 depict mean daily dose of prescribed antidepressants and ATC classification of antidepressant drugs respectively, where, the letters "A," "T," and "C" stand for the anatomical location of action, therapeutic indication, and chemical class of the medication, respectively. The daily assumed maintenance dose (DDD) of a medication used for its primary indication in adults is calculated. The PDD is the actual prescribed daily dosage of a medication. A ratio which was <1 was observed in the instance of Paroxetine, Nortriptyline and Mirtazapine

indicating underdosing. A ratio which was >1 was seen for Sertraline, Escitalopram, Opipramol, Desvenlafaxine, Fluvoxamine and Imipramine indicating overdosing. Out of 100 prescriptions, only 14% were having Fixed Dose Combination whereas no prescription was found with any banned drug.

While doing the historic comparison of antidepressant-prescribing patterns between non-COVID era and post-COVID era, we found that in recent years, newer antidepressants including selective serotonin reuptake inhibitors (SSRIs) have steadily supplanted traditional medications like tricyclics and monoamine oxidase inhibitors as depicted in **Table 5**.

Table 5: Historic comparison of antidepressant drugs prescribing trends between Non-COVID era studies vs. our post-COVID era study (*Source: original)

Parameters	Non-COVID era studies					Post-COVID era study (2020-21)
	Dutta S et al, 2015	Tripathi A et al, 2016	Kehinde OA et al, 2017	Hussain A et al, 2018	Tejashwini K et al, 2019	
Mean age (yrs)	40.41±1.34	39±14.28	31-45	20-60	41-60	38.77±10.81
Male:Female	1:1.17	1.10:1	1:2	1:1.15	1.11:1	1:1.27
Rural:Urban	-	-	-	-	-	2:1
Married:Unmarried	1.58:1	-	1.6:1	-	6:1	6:1
Educational status	-	-	-	-	SSC>Primary>HSC & above>Illit. (46%>45%>5%>4%)	SSC>HSC>Grad. & above>Pri.>Mid.=Illit. (26%>23%>17%>12%>11%=11%)
Prevalence of diseases	-	Depression>Anxiety>Others (52%>24%>23%)	Bipolar>Mild depression (61%>17%>16%>5%)	Depression>Adjustment disorder>Anxiety>OCD>Alc. dependence (69%>>>9%>8%>5%>4%)	Depression>Schizoph. with depression>Bipolar (92%>6%>1%)	Post-COVID depression>Mixed anxiety with depression>Schizophrenia with depressive features=OCD>Bipolar (67%>>>10%>6%=6%>3%)
Commonly prescribed ADDs	Venla.>Mirtaz.>Fluox.>Escit. (30%>25%>17%>15%)	Escit.>Sertr.>Amitr. (36%>13%>10%)	Amitr.>Sertr.>Escit. (60%>20%>11%)	Escit.>Sertr.>Amitr.>Fluox.>Mirtaz. (-)	Fluox.>Sertr.>Escit. (48%>47%>3%)	Sertr.>Parox.>Escit.>Nortrip.>Opipr.>Desvenl.>Fluvox.=Mirtaz. (43.52%>31.48%>12.96%>4.63%>2.78%>1.85%>0.93%=0.93%)
Concomitant drugs	Alpraz.>Divalpro.>Olanz.>Ca./Vit. D (59%>44%>42%>40%)	Clonaz.>Olanz.>Li. (37%>10%>3%)	-	Clonaz.>B-complex>Valproic acid>Olanz.>Li. (87%>38%>14%>->-)	Clonaz.>Olanz.>Risper.>Trihexi. (27%>>3%>2%>0.3%)	Clonaz.>Amisulp.>Etizol.>Olanz.>Gabapentin>Divalpro.=B-complex>Li. (41.46%>18.90%>16.46%>3.66%>2.44%>1.83%=1.83%>0.61%)

IV. DISCUSSION

The COVID-19 pandemic emerged as the modern world's most severe and difficult public health issue. In addition to the alarmingly high death rate, countries all over the world are still experiencing an increase in the agonizing psychological effects, such as anxiety and sadness, which affect individuals of all ages [8]. It may be due to a combination of genetic, psychological, and environmental factors. To quote a few, there may be certain associated risk factors to it like family history, lifestyle changes, substance abuse, chronic co-morbid health conditions and certain medications [9].

In our study, monitoring systems rationalizing the prescribing trends were followed as per the principles of WHO core prescribing indicators to evaluate the level of polypharmacy, the propensity to prescribe medications under generic names, and the total amount of injections and antibiotics used. The different prescribing pattern, patient care, facility parameters evaluated in this study provided an insight into prescribing behavior of doctors in a tertiary healthcare set-up of J&K in North India.

The term ‘antidepressants’ refer to the mainstream drugs/medicines prescribed for the treatment of depression; the qualitative and quantitative assessment of which in the Psychiatry department at Govt. Medical College and Hospital, Jammu amidst COVID-19 pandemic was the focus of this study. Antidepressants were prescribed more in females than males. Similar result was found in a study conducted by Kumar S 2021 where major chunk of patients were contributed by females (67.2%) [10]. This greater incidence of depression in women is the most consistent finding in epidemiology studies conducted on depression all over the world especially in due times of pandemic [11] and [12]. Also, majority of patients affected were from rural strata (61%) in our study which is consistent to the findings of Wang Y et al, 2020 [13]. The observed steeper rural gradient, which is a result of factors such as healthcare infrastructure, the economy, sanitation, and educational resources, highlights the significant public health implications of providing equitable healthcare services in rural and resource-constrained communities in such hard times of pandemic.

In the present study it was seen that the greatest proportion of patients under mental stress during the pandemic were in the age group 30-49 years and comprised 63% of the total cases which are almost in congruity with the results depicted by Salari N et al, 2020 [11]. The main reason for this could be that as people of this age group are the mainstay of any society's active workforce, therefore they are primarily impacted by layoffs and company closures since they are more likely to be concerned about the long-term effects and financial difficulties this epidemic may entail. Additionally, some experts have suggested that young people's increased access to information via social media, which can also lead to stress, may be the reason of their increased anxiety [11]. Those with higher education levels experienced higher levels of worry, anxiety, and despair during the COVID-19 epidemic [11]. New research indicates that there was a correlation between depression and education levels during the COVID-19 epidemic [14]. This may be linked to the fact that educated tech-savvy responders tend to pay more attention to updates and media news than the illiterate ones, thus exposing them more to the shroud of the pandemic and inducing a higher risk of depression and anxiety.

While analyzing the historic comparison of antidepressant drugs utilization trends between non-COVID era studies vs. our post-COVID era study, we discovered that a greater than anticipated rise in mental discomfort affected every group nearly equally, with 92% of our survey's demographic categories indicating a significant increase in mental distress during a lockup indoor stay. We hypothesized that characteristics linked to antecedent health inequalities, including but not limited to gender, age, low socioeconomic status, and traits unique to the specifics of the situation, such as household dynamics and keyworking, could be most strongly linked with deteriorating mental health. Our findings suggest that being a young adult, a woman, and residing in a household has had a particularly significant impact on how much mental suffering has developed throughout the outbreak itself. While rates of mental anguish were higher among people who were unemployed or in other economically inactive occupations like being a full-time student, the increase in mental discomfort among those who were employed prior to the pandemic was greater than previous trends prior to lockdown. This category includes those who have experienced job loss, income decline, furloughs, attempts to transition to freelance employment, or mandated work that has exposed them to COVID-19 infection [15].

As per WHO prescribing indicators, we observed that the typical quantity of antidepressants per prescription was 2.7 ± 0.8 which is slightly higher than the recommended limit of 2 drugs per encounter [16]. However, few other studies reported yet higher averages ranging from 3.12 drugs [17] per prescription to as high as ≥ 6 drugs [18] per encounter as compared to our study. Hence, it is clearly evident that there is wide variation in prescribing practices in India. Some of these centre around practitioners (e.g. ambiguity in diagnostic practices), patients (demand for quick relief), providers (availability of non-essential and irrational drugs or their combinations) and pharmaceuticals (aggressive medicine promotion).

Fortunately, the picture with regards to fixed dose combination is far more consistent and rewarding corresponding to inclusion of only 14% of FDCs in our study. Strikingly paradoxical results were shown by Teli

SESI et al, 2021 exhibiting 74.7% of FDCs in their analyses [19]. Although FDCs aren't necessarily irrational, some of them can't be justified in terms of better therapeutic efficacy, less toxicity or reduced cost.

The last several years have seen a global shift in the prescribing of antidepressants, with newer and selective serotonin reuptake inhibitors (SSRIs) increasingly taking the place of more traditional medications like tricyclics and monoamine oxidase inhibitors [20]. Our results stand congruous with the results of the antidepressant use study conducted in East Asia, which showed that sertraline was prescribed more often than Escitalopram [21].

The difference between a medication's recommended daily dosage (PDD) and defined daily dose (DDD) offers insight into how the drug is actually used. PDD for sertraline, escitalopram, opipramol, desvenlafaxine, fluvoxamine, and imipramine was higher than DDD in our study, whereas PDD was lower than DDD for paroxetine, nortriptyline, and mirtazapine. These medications' adverse effects may be the cause of reduced PDD. Additionally, a sizable portion of the patients in our study were new cases, and since TCAs are initially administered at low doses because of side effects, titrating the dose upward based on the patient's response could be another explanation for reduced PDD.

V. CONCLUSION

A plethora of novel obstacles for research, health policy, and service delivery were brought about post COVID-19 pandemic. Therefore, owing to this pandemic-triggered mental stress, the use of antidepressants is on rise. As such, prescribing and dispensing survey marks a touchstone towards rational prescribing of these drugs.

To conclude, the mental health problems rooting from COVID-19 and governmental responses to the pandemic are not necessarily new; instead, pre-existing mental health inequalities could become more entrenched and tackling them might be even more challenging in times of pandemic. There's no doubt that such catastrophe has brought people's differing life circumstances into stark contrast in terms of access to outside and inside space, household crowding, lack of school provision and childcare, food insecurity, domestic violence, addiction, access to internet and maintenance of social connectivity, as well as economic reserves which actually are all relevant to mental health. An appropriate, proportionate response to mitigate and manage additional needs thus requires more high-quality information to be included in public health messaging about mental health during the pandemic, alongside adequately resourced services.

Last but not the least, since in regard to drug prescribing and patient care practices, a few parameters are found a bit inapt, thus figuring out a need for intervention. Hence, it is need of the hour that the state authorities should formulate and effectively implement clear and comprehensive SOPs to curb such dynamicity of irrationality, therefore, ensuring a rational yet pragmatic use of drugs, especially antidepressants, in this global post COVID-19 rife.

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