

DRUG UTILIZATION STUDY OF PSYCHOTROPIC DRUGS IN PSYCHIATRY OUTDOOR PATIENTS AT A TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: The objective of this study was to evaluate the drug utilization pattern of psychotropic drugs prescribed in patients as per the World Health Organization core prescribing indicators.

Methods: The investigation examined all patient medical records who visited the outpatient department of the Department of Psychiatry, Silchar Medical College and Hospital between September 2023 and March 2024. The prescriptions were analyzed for indicators of drug use such as the quantity of drugs prescribed, generic name prescriptions, essential drug list prescriptions, antibiotics prescribed, injection prescribed, and the percentage of polypharmacy.

Results: A total of 600 prescriptions were examined. The most common type of psychotropic drug administered was antidepressants. Psychotropic drugs were administered on an average of 1.64 times per prescription. The proportion of generic names was 98.88%; the proportion of prescription encounters involving an injection was 3.33%; the proportion of psychiatric medications prescribed from the National List of Essential Medicines (NLEM) was 62.53%; and the proportion of polypharmacy was 5.5%.

Conclusion: This study setting performed well in terms of the proportion of prescriptions that included injections and antibiotics; nevertheless, it fell short of recommendations in terms of NLEM drugs, generic drugs, and minimizing polypharmacy.

Keywords: Psychotropics, Prescribing pattern, Drug utilization, Polypharmacy, World Health Organization drug use indicators.

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INTRODUCTION

As per the World Health Organization (WHO), rational use of drugs is defined as, "Patients receive medications appropriate to their clinical needs, in doses that meet their requirements, for an adequate period, and at the lowest cost to them and their community" [1,2]. "The marketing, distribution, prescription, and use of drugs in a society with special emphasis on the resulting medical, social, and economic consequences" was how the WHO described drug use in 1977 [3]. The International Network for Rational Use of Drugs (INRUD) and the WHO have made standard prescribing indicators due to growing concerns about drug prescriptions due to the unjust distribution of prescriptions. Prescribers can use these indicators to enhance prescription quality. The WHO suspects that more than half of the medicines that are administered are not warranted, thereby leading to issues such as drug combinations, drug resistance development, and non-compliance [4]. The WHO states that countries can save up to 5% of their health-care costs by making orders more reasonable, keeping low prices, and making a better quality of drugs [5]. Psychiatric disorders are a big threat to public health. The area of psychopharmacology is evolving rapidly, which challenges traditional ideas about treating mental illnesses. Therefore, psychiatrists are constantly prescribing new drugs that claim to be safer and more effective [6]. To the best of our knowledge, there is a dearth of studies investigating the prescription of psychotropic drugs in North-East India. Therefore, the values that were measured in this study could be used as a benchmark for ongoing quality tracking of medicine prescribing and as a way for health-care facilities to compare themselves to others. This study used WHO core prescribing indicators and aimed to identify the lacunae which would be helpful in rationally prescribing in the future. The objective of the

research is to investigate the pattern of utilization of psychotropic drugs as per WHO core prescribing indicators.

METHODS

Study design

This was a retrospective, observational, and cross-sectional study.

Study duration

The study period was 6 months (September 1st, 2023–March 1st, 2024).

Study setting

This study was conducted by the Department of Pharmacology at Silchar Medical College and Hospital and the Department of Psychiatry at Silchar Medical College and Hospital, Assam.

Data collection

After obtaining ethical clearance from the Institutional Ethics Committee of Silchar Medical College and Hospital, the study's medical records were obtained from the medical records section of the Department of Psychiatry. The case record form and the WHO prescribing indicator form were used to record information [7,8].

WHO core recommended indicators were used to assess parameters such as the quantity of drugs prescribed, generic name prescriptions, essential drug list prescriptions, antibiotics prescribed, injection prescribed, and the percentage of polypharmacy [9]. The values were compared to the WHO's recommended values and other relevant research studies [10]. Demographic details such as age and gender, pattern of psychotropic drugs, and name and class of psychotropic drug prescribed were also obtained from the medical records.

Inclusion criteria

1. Medical records of patients of all ages and both sexes who reported to the outpatient department of psychiatry at Silchar Medical College and Hospital, Silchar.

Exclusion criteria

1. Incomplete medical records pertaining to drug-related information.

Sample size

The WHO states that at least 600 prescribing meetings should be used to test prescribing indicators [7]. There are 600 medical records in this set, which spans 6 months (180 days). Hence, the number of samples taken every day is 600/180, which equals 3.3 samples per day. Hence, using the simple randomization method, about four samples (medical records) were taken from each day. The data from the prescriptions were put together in Microsoft Excel 2016 and analyzed.

RESULTS AND DISCUSSION

The results showed that a total of 600 prescriptions were studied, which included 1362 different drugs. There were 1362 drugs, and 985 (72.32%) of them were psychotropics. The study found that mental illness was more common in women (53.33%) than men. Tables 1 and 2 describe the prescription trend for psychotropic drugs based on age and gender as well. The age group of 41–50 was the largest group of psychotropic drug users (26.16%). Every prescription came with an average of 2.27 medicines and every prescription came with an average of 1.64 psychotropic drugs. A large portion (98.88%) of psychotropic drugs was given by their generic names. There were no records of antibiotic administration. Only a small amount of the drug was given as an injectable (3.33%). Majority of the psychotropic drugs that were prescribed (62.53%) were from the National List of Essential Medicines (NLEM) 2022. Polypharmacy only made up a small part of orders (5.5%) (Table 3). Antipsychotics (15.19%) were the next most common type of drug provided, after antidepressants (18.57%) and sedative-hypnotics (17.69%).

Percentage of antidepressants prescribed: Escitalopram is the most frequently administered antidepressant (55.70%), and fluoxetine is the next most common (13.01%) (Fig. 1).

Percentage of different sedative-hypnotics prescribed: Clonazepam has been prescribed most frequently (64.71%), followed by lorazepam (18.22%) (Fig. 2).

Percentage of different antipsychotic drugs prescribed: Of all the antipsychotic drugs studied, olanzapine was administered the most (34.30%), followed by risperidone (20.33%) (Fig. 3).

Prevalence of mood stabilizers prescribed: Sodium valproate was prescribed 84.01% of the time, making it the most frequent mood stabilizer (Fig. 4).

As compared to the WHO criterion of 1.6–1.8 [10], an average of 2.27 medications were prescribed per prescription in our study, which is higher to the 2.37% result found in a study by Mudhaliar *et al.* [11]. In a public health facility, Sisay *et al.* evaluated rational drug use using WHO core drug use indicators. They found that 2.34 pharmaceuticals were prescribed on average per prescription [12]. In an Indian setting, the figure was 2.49, according to Teli *et al.*'s study on psychotropic prescriptions carried out at a Jalgaon tertiary care center [13]. On the contrary, Tejus *et al.* observed that the number was 2.35 [9]. These results indicate that this center needs to do better to fulfill the recommendations of the WHO. A higher number of medications per prescription typically indicate polypharmacy, a worldwide phenomenon with unfavorable consequences. Regularly taking at least five medications is known as polypharmacy; nevertheless, evidence-based

Table 1: Prescription pattern based on age

Age group (in years)	No. of prescriptions (percentage of total prescriptions)
1–10	21 (3.5)
11–20	119 (19.83)
21–30	128 (21.33)
31–40	91 (15.17)
41–50	157 (26.16)
51–60	63 (10.5)
61–70	7 (1.17)
71–80	7 (1.17)
81–90	7 (1.17)

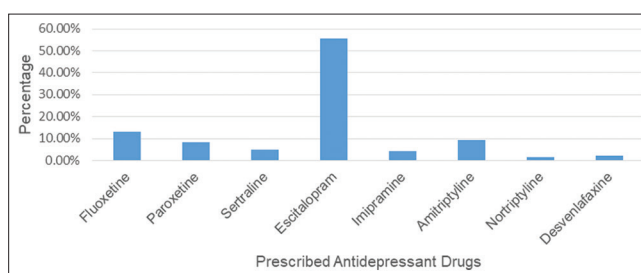
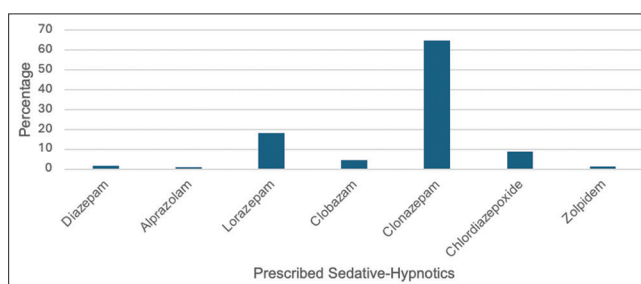
Table 2: Prescription pattern based on gender

Gender	Percentage
Male	46.67
Female	53.33
Male: Female ratio	0.87:1

Table 3: Analysis of prescriptions based on WHO core prescribing indicators

WHO core prescribing indicators	Values (%)
Number of prescriptions	600
Total drugs	1362
Psychotropic drugs	985
Drugs per prescription	2.27
Average number of psychotropic drugs per prescription	1.64
Generic name psychotropic drugs	98.88
Injectables	3.33
Antibiotics prescribed	0
Percentage of psychotropic drugs prescribed from NLEM 2022	62.53
Polypharmacy percentage	5.5

WHO: World Health Organization, NLEM: National List of Essential Medicines

**Fig. 1: Prescribing prevalence of various antidepressant drugs****Fig. 2: Prescribing prevalence of various sedative-hypnotics**

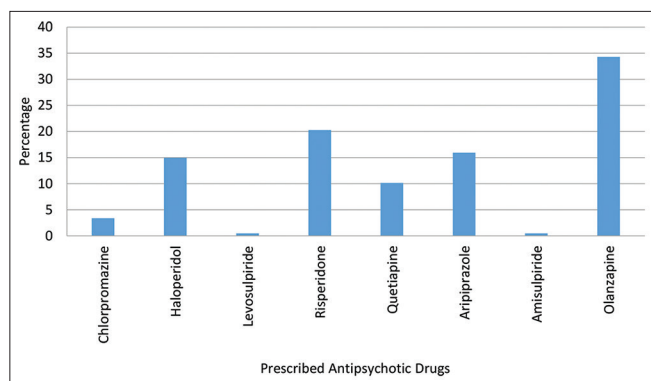


Fig. 3: Prescribing prevalence of various antipsychotic drugs

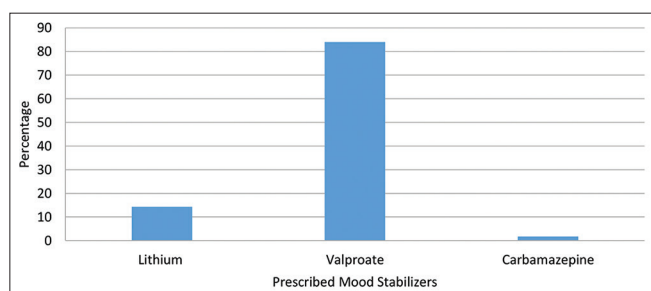


Fig. 4: Prescribing prevalence of mood stabilizers

practice is increasingly being advocated in its place [14]. Numerical measurements of polypharmacy frequently fall short of providing information about the suitability of prescribed drugs. Although the number of drugs prescribed per prescription was optimal in our study, 5.5% of prescriptions involved the use of more than five medications, which is higher than the 4.53% and 3.7% values found in studies by Tejus *et al.* and Teli *et al.*, respectively [9,13]. In their study, Mudhaliar *et al.* found that patients received an average of 1.72% of psychotropic drugs per prescription [11]. However, this study found that while the average number of prescriptions for medicines was higher, the average number of psychotropics was only 1.64. This indicates a significant use of medications other than psychotropics, such as promethazine, multivitamins, and PPIs, which are frequently used to treat coexisting illnesses in patients or to supplement treatment. More research is necessary because a closer examination of the prescribing pattern for these medications may be necessary.

The WHO and the Indian National Medical Council promote the usage of generic medicine names [15,16]. While still below the WHO criterion of 100% [10], our study's 98.88% prescription rate for generic versions of psychiatric medications is higher than that of studies by Mudhaliar *et al.* and Sisay *et al.*, respectively [11,12]. This finding differed dramatically from that of Teli *et al.*'s study, which found that only 87.5% of antipsychotic prescriptions were written under their generic names [13]. However, Tejus *et al.*'s study from North India observed a value of 91.3% [9]. Our findings suggest that more development is still necessary. According to Kumar *et al.*, doctors are influenced by marketing pressures from the pharmaceutical sector to sell a particular brand of medications [17]. Although the pharmaceutical business does not exert pressure at our facility, one corporation has a monopoly over the manufacturing of specific pharmaceuticals. The fact that writing those names has become second nature to clinicians may account for the 1.2% of prescriptions that contain brand names, as they frequently fail to recognize the folly of doing so. It will take a deliberate effort to break the tendency of using generic names instead of brand names among clinicians, as it has become a habitual practice.

Injectable medications were prescribed in just 3.33% of prescriptions in our survey, which is well within the WHO's suggested range of <24.1% [10]. This conclusion was in contrast to that of Tejus *et al.*, who noted that the total encounter rate with injectables was 2.39% in their investigation [9]. According to Kumar *et al.*, 0.44% of prescriptions included injectables [17]. A different study conducted in South India by Mudhaliar *et al.* found that only 1.94% of all interactions with injectables were reported [11]. Injectable psychotropics are used as long-acting injectables for maintenance or as emergency doses. Their use depends on different types of patients, the accessibility of injectables, and regional regulations at different facilities. The introduction of newer long-acting injectables has shown to improve patient care due to their improved tolerability and efficacy; nonetheless, this has raised concerns over the cost-effectiveness of psychiatric treatment. In our investigation, no prescriptions for antibiotics were written, which is well within the WHO's suggested threshold of <26.8% [10] and which is comparable to the research carried out by Kumar *et al.* [17]. According to the WHO, essential drugs are those that "fulfill the population's primary health-care needs; chosen with consideration for disease prevalence and public health significance; evidence of safety and efficacy; and comparative cost-effectiveness" [18]. The WHO published the first list of essential medications in 1977 and has since updated it to give member countries direction. The Indian NLEM was first published in 1996, and its most recent revisions were made in 2022, in accordance with the WHO's guidelines [19]. The NLEM 2022 was followed by 62.53% of psychotropic prescriptions in our sample, which is lower than the 100% WHO standard [10]. This figure, however, was greater than that of the Tejus *et al.*'s study, which found that 55.02% of prescriptions were from the National Essential Drug List, which is a list of psychotropic medications obtained from the NLEM [9]. Pugazhenthian *et al.* found that 95% of the medications prescribed in their study on the drug usage pattern in dermatology were from the NLEM [20]. Only four antipsychotics, three antidepressants, three medications for treating bipolar mood disorder, and two sedative-hypnotic medications make up NLEM 2022 [21]. While the medications on this list might be sufficient for smaller outlying centers, they are insufficient to provide the standard of care at a tertiary care facility like ours, where we make an effort to provide the most effective and tolerable medications. At this center, it seems necessary to supplement the NLEM's psychotropic prescriptions; still, it would be wise to consider adding more psychotropics to the next revision of the NLEM. According to Tejus *et al.*'s study on the prescription pattern of antipsychotics, the age group of 41–50 years old received the greatest number of antipsychotic prescriptions (22.17%) [9], which is consistent with the findings of our study, which indicate that the age group of 41–50 years received the greatest number of psychotropic drug prescriptions (26.20%). Our findings are in congruence with the National Mental Health Survey of India, 2015–2016 report, which indicates that psychotic, bipolar, neurotic, and stress-related illnesses are most common among people between the ages of 40 and 49 [21]. Similar findings were also observed in our study. Tejus *et al.*'s analysis of psychotropic prescription patterns revealed that antidepressants were the most often prescribed psychotropic drugs, with escitalopram being the most widely used antidepressant [9]. There were 207 prescriptions for antipsychotics made in the current study. Olanzapine (34.3%) was the most often given antipsychotic out of all of them, followed by risperidone (20.3%). However, another study by Kumar *et al.* conducted in India had revealed a higher utilization of risperidone (56.17%) [17]. Approximately 17.69% of all prescribed medications included benzodiazepines. This could be the result of the fact that benzodiazepines are used therapeutically to treat a wide range of disorders by temporarily relieving symptoms. More research is necessary since it is possible that benzodiazepines are being overused and misused at this facility, even if there is not any data available for a direct comparison. The most often administered sedative-hypnotic in our study was clonazepam (64.7%), followed by other sedatives. According to a Tejas *et al.* study, clonazepam is the sedative-hypnotic that is administered the most frequently [9]. It is evident that while

there are areas for development, as mentioned earlier, there are also some positive results. We have observed that there is a need to prevent polypharmacy, boost prescriptions from the NLEM, and increase prescriptions using generic names. We also observed that our center is performing well in comparison to other centers both nationally and internationally. Our results are comparable to research done in India and overseas about medication classifications. While achieving the perfect prescription pattern is unattainable in practice, examining the same opens the door to a slow but steady improvement process that we believe will continue. The study's strength lies in its retrospective data-gathering method, which not only simplifies the process but also reduces the possibility of biases resulting from differences in treatment modalities, doctor prescriptions, and disruptions in the drug supply. To the best of our knowledge, this study is the first of its kind in North-East India.

Limitation

The study was subjected to significant limitations. As this was not a prospective trial, we were not able to obtain the illness-related data that would have provided additional context for rational drug usage. Furthermore, it is possible that some information about patients who did not collect medications at the dispensary due to nonavailability or other factors was overlooked. Due to the fact that the study was conducted at a single facility, the prescription pattern was determined by regional regulations and represented the expertise and viewpoints of a small number of the center's physicians. This could be the cause of bias. The incompleteness of the data in some of the medical records, which reduced the sample size, was another constraint. We were able to gather data that could be readily compared with other research conducted throughout the world using WHO markers. To evaluate the prescription trends for the entire medical community, we propose conducting comparable multicentric studies with a prospective design in the future. Such studies are warranted to improve individual medical practices and rational drug prescribing nature, as well as bring uniformity and standardization to the prescription patterns of different psychiatry centers across the nation.

CONCLUSION

This study used the WHO/INRUD core medication prescribing indicators to assess the drug prescription performance of a tertiary care hospital in Northeast India. Prescriptions for medications under generic names, prescriptions from the NLEM, and the reduction of polypharmacy all have room for improvement. Additional research on specific psychotropics can be conducted using the baseline data from this study on psychotropic medications. It is possible to carry out more multicentric prospective studies along these lines to look into the causes of drug use that is not reasonable.

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AUTHOR'S CONTRIBUTION

Pranab Das: One of the researchers who came up with the study concept and research topic. Moreover being involved in the design of the study, defining intellectual content, searching the literature, and obtaining and analyzing data, he was also involved in preparing and editing manuscript, and also reviewing it. Nivedita Saha: One of the authors who came up with the study's framework, was also involved in data collection, literature search, study design, intellectual content definition, collecting data, and manuscript writing. Dolly Roy: One of the developers of the study's concept. In addition, she had also contributed in the design of the study, defining the intellectual contents, searching the literature, acquiring data, preparing and reviewing the manuscript, and supervised all phases of the research process.

CONFLICTS OF INTEREST

The authors have disclosed no known or prospective conflicts of interest.

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REFERENCES

- Chakraborty D, Debnath F, Kanungo S, Mukhopadhyay S, Chakraborty N, Basu R, et al. Rationality of prescriptions by rational use of medicine consensus approach in common respiratory and gastrointestinal infections: An outpatient department based cross-sectional study from India. *Trop Med Infect Dis.* 2023 Jan 28;8(2):88. doi: 10.3390/tropicalmed8020088
- Shanmukananda P, Veena DR, Jagadish S, Poorvi M. Prescription audit in post-operative patients of Dr. B. R. Ambedkar Medical College and Hospital, Bengaluru. *Natl J Physiol Pharm Pharmacol.* 2023 Sep 5;13(4):763-7. doi: 10.5455/njppp.2023.13.07365202205092022
- Manirajan P, Sivanandy P. Drug utilisation review among geriatric patients with noncommunicable diseases in a primary care setting in Malaysia. *Healthcare (Basel).* 2023 Jun 6;11(12):1665. doi: 10.3390/healthcare11121665
- Bilge SS, Akyüz B, Ağrı AE, Özlem M. Rational drug therapy education in clinical phase carried out by task-based learning. *Indian J Pharmacol.* 2017 Jan-Feb;49(1):102-9. doi: 10.4103/0253-7613.201009
- Sarangi SC, Kaur N, Tripathi M, Gupta YK. Cost analysis study of neuropsychiatric drugs: Role of National List of Essential Medicines, India. *Neurol India.* 2018 Sep-Oct;66(5):1427-33. doi: 10.4103/0028-3886.241345
- Taylor DM, Barnes TR, Young AH. *The Maudsley Prescribing Guidelines in Psychiatry.* Vol. 14. Hoboken: John Wiley and Sons; 2021 Apr 4. p. 755-860.
- Habibyar AF, Nazari QA. Evaluation of prescribing patterns using WHO core drug use indicators in a pediatric hospital of Kabul Afghanistan: A prospective cross-sectional study. *Heliyon.* 2023 Nov 2;9(11):e21884. doi: 10.1016/j.heliyon.2023.e21884
- Mandal P, Asad M, Kayal A, Biswas M. Assessment of use of World Health Organization access, watch, reserve antibiotics and core prescribing indicators in pediatric outpatients in a tertiary care teaching hospital in Eastern India. *Perspect Clin Res.* 2023 Apr-Jun;14(2):61-7. doi: 10.4103/picr.picr_22_22
- Tejus A, Saxena SK, Dwivedi AK, Salmani MF, Pradhan S. Analysis of the prescription pattern of psychotropics in an outpatient department of a general hospital psychiatry unit. *Med J Armed Forces India.* 2022 Jan 1;78(1):74-9. doi: 10.1016/j.mjafi.2020.03.006
- Anagaw YK, Limenh LW, Geremew DT, Worku MC, Dessie MG, Tessema TA, et al. Assessment of prescription completeness and drug use pattern using WHO prescribing indicators in private community pharmacies in Addis Ababa: A cross-sectional study. *J Pharm Policy Pract.* 2023 Oct 20;16(1):124. doi: 10.1186/s40545-023-00607-3
- Mudhaliar MR, Ghouse IS, Sadubugga P, Narala SR, Chinnakotla V, Yendluri P. Psychotropic drug utilization in psychiatric outpatient department of a tertiary care teaching hospital in India. *Int J Res Med Sci.* 2017 Mar 28;5(4):1612-6. doi: 10.18203/2320-6012.ijrms20171274
- Sisay M, Mengistu G, Molla B, Amare F, Gabriel T. Evaluation of rational drug use based on World Health Organization core drug use indicators in selected public hospitals of Eastern Ethiopia: A cross sectional study. *BMC Health Serv Res.* 2017 Feb 23;17(1):161. doi: 10.1186/s12913-017-2097-3
- Teli SE, Ramanand J, Mandhare R, Bhangale C. Prescription pattern of psychotropic drugs among patients attending outpatient department of psychiatry: A cross-sectional study. *Natl J Physiol Pharm Pharmacol.* 2021 Nov 30;11(12):1318-21. doi: 10.5455/njppp.2021.11.06207202123062021
- Martsevich SY, Kutishenko NP, Lukina YV, Drapkina OM. Polypharmacy: Definition, impact on outcomes, need for correction. *Ration Pharmacother Cardiol.* 2023 Jul 27;19(3):254-63. doi: 10.20996/1819-6446-2023-2924
- Mostafa S, Mohammad MA, Ebrahim J. Policies and practices catalyzing the use of generic medicines: A systematic search and review. *Ethiop J Health Sci.* 2021 Jan 1;31(1):167-78. doi: 10.4314/ejhs.v31i1.24

16. Mahato TK, Sharma S, Patel A, Ojha SK, Agnihotri V. Prescribing by generic name: Pros and cons. *Poetique*. 2023 Sep 14;10(9):61-72. doi: 10.5281/zenodo.8344560
17. Kumar S, Chawla S, Bimba HV, Rana P, Dutta S, Kumar S. Analysis of prescribing pattern and techniques of switching over of antipsychotics in outpatients of a tertiary care hospital in Delhi: A prospective, observational study. *J Basic Clin Pharm*. 2017 Jun-Aug;8(3):178-84.
18. Costa E, Moja L, Wirtz VJ, van den Ham HA, Huttner B, Magrini N, et al. Uptake of orphan drugs in the WHO essential medicines lists. *Bull World Health Organ*. 2024 Jan 1;102(1):22-31. doi: 10.2471/BLT.23.289731
19. Parmar A, Pal A, Sharma P. National list of essential medicines 2022 of India: Perspectives from psychiatrists. *Indian J Psychol Med*. 2023 Feb 16;45(4):411-4. doi: 10.1177/02537176231155328
20. Pugazhenthan T, Ravichandran UA, Aravindan U, Tamilselvan T, Giri VC, Ali MK. Evaluation of drug use pattern in central leprosy teaching and research institute as a tool to promote rational prescribing. *Indian J Lepr*. 2017 Apr 1;89(2):99-107.
21. Sinha P, Hussain T, Boora NK, Rao GN, Varghese M, Gururaj G, et al. Prevalence of common mental disorders in older adults: Results from the National Mental Health Survey of India. *Asian J Psychiatr*. 2021 Jan 1;55:102463. doi: 10.1016/j.ajp.2020.102463