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RESEARCH ARTICLE
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COST-MINIMIZATION ANALYSIS OF PSYCHOTROPIC DRUG AT A TERTIARY CARE TEACHING HOSPITAL IN INDIA.

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Abstract

Background: Mental disorders impose a substantial burden in India, with high treatment gaps exacerbated by the cost of branded psychotropic medications. The Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) offers quality-assured generic drugs at significantly lower prices. This study aimed to perform a cost-minimization analysis comparing branded psychotropic prescriptions with their PMBJP generic equivalents in a tertiary care psychiatry outpatient department (OPD).

Methods: This prospective observational study was conducted over six months (January 2025 to June 2025) in the psychiatry outpatient department (OPD) of Santosh Medical College, a tertiary care teaching hospital in Ghaziabad, India. A total of 512 prescriptions from patients aged 18-80 years meeting the inclusion criteria were analyzed. The lowest-priced branded formulation available in the hospital pharmacy for each drug, strength, and dosage form was selected as the reference price to provide a conservative estimate, while generic reference prices were obtained from the official PMBJP-listed maximum retail prices for equivalent formulations. Costs were calculated using a standardized quantity of 10 tablets/capsules per prescribed drug per outpatient visit, irrespective of dosing frequency or treatment duration, to provide a consistent basis for comparing branded and generic reference costs. Data were analyzed using descriptive statistics in Microsoft Excel.

Results: The total cumulative branded prescription cost was ₹1,05,633, compared with ₹22,502 using PMBJP generic reference prices, indicating potential savings of ₹83,131 (78.7%). The average cost per prescription could decrease from ₹206.34 to ₹44.04. Class-wise cost reductions ranged from 74.5% (mood stabilizers) to 88.5% (Z-drugs), with the highest individual drug savings observed for zolpidem (88.5%), clonazepam (86.9%), and olanzapine (82.2%).

Conclusion: Generic substitution of psychotropic medications under the PMBJP scheme could result in substantial cost reductions (nearly 80% overall) in outpatient psychiatric care assuming therapeutic equivalence. These findings support generic prescribing as a potential approach to improving affordability and reducing the economic burden on patients with mental disorders in India.

Keywords: Cost-minimization analysis, psychotropic drugs, generic medicines, PMBJP, psychiatry outpatient department

INTRODUCTION

Mental disorders constitute a major public health concern globally and are among the leading causes of disability and reduced quality of life. Conditions such as depressive disorders, anxiety disorders, bipolar disorder, and schizophrenia contribute substantially to years lived with disability worldwide, particularly in low- and middle-income countries[1,2]. In India, findings from the National Mental Health Survey have revealed a high prevalence of both common and severe mental disorders, with a significant proportion of affected individuals requiring long-term or lifelong pharmacological treatment[3].

Psychotropic medications form the backbone of management for most psychiatric illnesses and are frequently prescribed for extended durations. As a result, drug therapy represents a major component of the overall cost of mental healthcare[4]. In the Indian healthcare system, where out-of-pocket expenditure accounts for a large share of total health spending, the cost of medicines plays a critical role in determining access to treatment and adherence[5,6]. Several studies have demonstrated that high medication costs are associated with poor adherence, premature discontinuation of therapy, and increased risk of relapse in patients with psychiatric disorders[7,8].

The economic burden associated with psychotropic drug therapy is further exacerbated by the widespread prescribing of branded formulations, despite the availability of lower-cost generic alternatives. Generic medicines are approved based on stringent regulatory requirements for bioequivalence, ensuring comparable efficacy, safety, and quality to branded products[9]. Nevertheless, substantial price variation exists between branded and generic psychotropic drugs, resulting in avoidable financial burden on patients[10]. Indian studies evaluating price variation have consistently reported wide cost differences across brands of commonly prescribed antidepressants, antipsychotics, mood stabilizers, and anxiolytics[11,12].

Prescribing behavior, patient perceptions, and concerns regarding the quality of generic medicines have been identified as important barriers to the wider adoption of generics in clinical practice[13]. Despite evidence supporting their therapeutic equivalence, generic psychotropic drugs remain underutilized in many healthcare settings, limiting the potential for cost savings at both individual and system levels[14].

To address issues of affordability and access to essential medicines, the Government of India launched the Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP), which aims to promote the use of quality-assured generic medicines through a nationwide network of Janaushadhi Kendras[15]. Several psychotropic medications are included under this scheme at substantially lower prices compared to their branded counterparts. Evaluations of the PMBJP initiative have demonstrated significant reductions in medicine costs for chronic diseases, highlighting its potential role in reducing out-of-pocket expenditure[16,17].

Cost-minimization analysis (CMA) is a pharmacoeconomic method used to compare the costs of interventions that are assumed to have equivalent clinical outcomes, with the objective of identifying the least costly alternative[18]. Given the established therapeutic equivalence between branded and generic psychotropic drugs, CMA provides an appropriate framework to assess potential cost savings associated with generic substitution in routine psychiatric practice. However, there remains a paucity of prescription-level evidence from tertiary care psychiatry outpatient settings in India.

In this context, the present study was undertaken to perform a cost-minimization analysis of psychotropic drug prescriptions in the psychiatry outpatient department of Santosh Medical College, with the aim of estimating potential cost savings achievable through substitution of branded drugs with their generic equivalents.

METHOD

This prospective observational study was conducted over a six-month period from January 2025 to June 2025, in the psychiatry outpatient department of Santosh Medical College, Ghaziabad, Uttar

Pradesh, India after obtaining approval from the Institutional Ethics Committee (Ref. No. SU/R/2024/1548). Prescriptions of 512 patients attending the psychiatry outpatient department during the study period were reviewed. Data were collected by examining prescription records to document prescribed psychotropic medications, including drug name, pharmacological class, and dose.

A cost-minimization analysis was performed to estimate potential cost savings, expressed in Indian Rupees and percentage, by substituting branded psychotropic drugs with their therapeutically equivalent generic formulations containing the same active drug with same given dose. Branded drug prices were obtained from the hospital pharmacy of Santosh Medical college. For a conservative estimate, the least expensive branded formulation available for a given drug and dose was selected as the reference price.

Drug costs were calculated using a standardized quantity of 10 tablets or capsules per prescribed drug per outpatient visit to standardize cost estimation across prescriptions, irrespective of dosing frequency or treatment duration. Generic drug prices were obtained from the Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP) using the listed maximum retail prices. Total and mean prescription costs per outpatient visit were calculated and compared between branded and generic drugs to determine overall and average cost savings.

Inclusion Criteria

1) Patients attending the psychiatry outpatient department during the study period
2) Prescriptions containing at least one psychotropic drug.
3) Patients of either sex and age from 18 to 80 years
4) Prescriptions with clearly documented drug name/s, dose/s, and formulation.

Exclusion Criteria

1) Inpatient prescriptions.
2) Prescriptions lacking complete drug, dose, or formulation details
3) Prescriptions involving fixed-dose combinations or psychotropic drugs without available generic equivalents under the PMBJP scheme.

Aim of the Study

To estimate the potential cost savings associated with substituting branded psychotropic medications with their PMBJP generic equivalents using a cost-minimization analysis of outpatient psychiatric prescriptions at Santosh Medical College, Ghaziabad, India.

Objective of the Study:-

1) To compare the costs of branded psychotropic medications with their PMBJP generic equivalents.
2) To analyze class-wise and drug-wise variations in cost reduction among commonly prescribed psychotropic drugs.
3) To estimate the potential cost savings (absolute and percentage) estimated under generic substitution

Sample Size: -

All patients attending the psychiatry outpatient department during the study period who met the inclusion criteria were considered for the study

Statistical Analysis

Data were compiled and analyzed using descriptive statistics. All statistical procedures were carried out using Microsoft Excel version 2021. Costs were summarized as mean values, and cost savings

were expressed as absolute differences in Indian Rupees and percentage reduction. No inferential statistical tests were performed, as the study involved direct cost comparisons without hypothesis testing.

Result :-

Table 1: Cost Minimization as per the Class

Drug class	Total Branded cost (₹)	Total Generic cost (₹)	%cost reduction
Antidepressants	42,180	10,260	75.7
Antipsychotics	33,950	6,520	80.8
Mood stabilizers	15,420	3,940	74.5
Benzodiazepines	10,060	1,320	86.9
Non-Benzodiazepine sedative, hypnotics (Z-drugs)	4,023	462	88.5

Class-wise cost-minimization analysis showed substantial reductions in expenditure with generic substitution across all psychotropic drug classes. The highest percentage cost reduction was observed for Z-drugs (88.5%), followed by benzodiazepines (86.9%) and antipsychotics (80.8%) as depicted in Figure 1

Figure 1:- Summary of Class wise Percentage Reduction

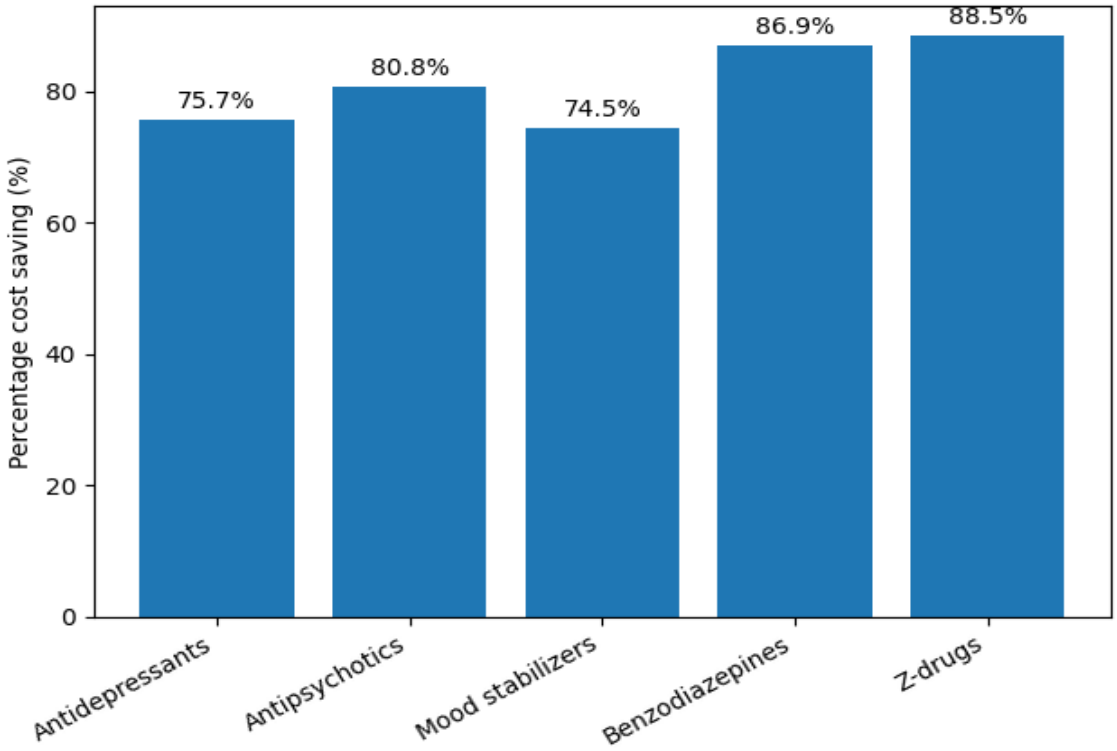


Table 2: Drug-Wise Cost-Minimization Analysis

Drug	Branded cost (₹)	Generic cost (₹)	Cost saving (₹)	% cost reduction
Escitalopram	11,420	2,940	8,480	74.3
Fluoxetine	7,180	1,420	5,760	80.2
Sertraline	8,760	2,060	6,700	76.5
Amitriptyline	6,420	1,640	4,780	74.5
Imipramine	4,120	1,020	3,100	75.2
Desvenlafaxine	4,280	1,180	3,100	72.4
Olanzapine	17,840	3,180	14,660	82.2
Quetiapine	16,110	3,340	12,770	79.3
Lithium	6,820	1,920	4,900	71.8
Sodium valproate	8,600	2,020	6,580	76.5
Clonazepam	10,060	1,320	8,740	86.9
Zolpidem	4,023	462	3,561	88.5

Drug-wise analysis indicated substantial potential cost reductions with generic substitution across all psychotropic medications (Table 2), with the highest percentage savings observed for zolpidem (88.5%) and clonazepam (86.9%), followed by olanzapine (82.2%) and fluoxetine (80.2%).

Table 3: Overall cost minimization analysis

Parameter	Branded (₹)	Generic (₹)	Cost minimization
Total cumulative cost	1,05,633	22,502	83,131 (78.7%)
Average cost per prescription	206.34	44.04	162.30

Overall cost minimization analysis showed that generic substitution could reduce the total cumulative reference cost from ₹1,05,633 to ₹22,502, indicating potential cost savings of ₹83,131 (78.7%). The estimated average cost per prescription could decrease from ₹206.34 to ₹44.04 following generic substitution.

Discussion:-

The present cost-minimization analysis demonstrates that substituting generic versions of psychotropic medications for their branded counterparts significantly reduces expenditure across drug classes, individual drugs, and overall prescribing in the outpatient psychiatric setting at Santosh Medical College. This finding is highly relevant in low- and middle-income settings where out-of-pocket medication costs are a major barrier to sustained mental health treatment.

While evaluating at the class level it demonstrated marked potential cost reductions across all psychotropic drug classes under generic substitution, with percentage savings ranging from 74.5% to 88.5%. The highest cost reduction was observed for Z-drugs (88.5%), followed by benzodiazepines (86.9%), antipsychotics (80.8%), antidepressants (75.7%), and mood stabilizers (74.5%). These findings highlight the substantial economic impact of generic prescribing at the drug-class level in psychiatric outpatient care.

Comparable quantitative findings have been reported in recent international studies. In 2024, Yılmaz and colleagues conducted a large cross-sectional pharmacoeconomic study in primary care centers affiliated with Istanbul University in Turkey. The investigators analyzed antidepressant prescriptions and demonstrated that substituting branded antidepressants with generic equivalents resulted in an average prescription cost reduction of 17.5%, with savings increasing to approximately 35% when the lowest-priced generic formulations were consistently selected[19]. Quantitative support for findings of our study is also evident in Indian market-based analyses. In 2022, Nivetha and Geetha conducted a cost variation analysis of commonly prescribed oral antipsychotics and others using pharmaceutical pricing data from Bengaluru, India, and reported that branded antipsychotic drugs were priced between 3- to 6-fold higher than their lowest-cost generic equivalents, translating into potential cost reductions ranging from 65% to over 80% when generics were substituted[20].

Similarly, when analyzing at individual drug, substantial variability in cost savings between individual psychotropic agents, with zolpidem and clonazepam showing the highest percentage reductions of 88.5% and 86.9%, respectively. Significant savings were also observed for olanzapine (82.2%) and fluoxetine (80.2%), indicating marked price differentials between branded and generic formulations at the molecule level.

This finding is strongly in alignment with a cross-sectional cost analysis study of various brands of sedative-hypnotic drugs in the Indian market by Yeragi et al. demonstrated substantial potential savings from generic substitution, with the highest for zolpidem (88.5%) followed by clonazepam (86.9%) which underscores the potential for significant financial relief for patients managing insomnia and anxiety disorders without compromising therapeutic efficacy[21]. Our study is also in agreement with a 2024 cost comparative study of commonly prescribed psychiatric medication carried out by Vasisht where he reported that among antipsychotics, olanzapine exhibited the most significant price gap; the maximum branded price for olanzapine 10 mg represented an 89.8% potential saving if substituted with a generic, while the category as a whole averaged a 71.6% saving. He also found that many classical antidepressants such as fluoxetine and escitalopram noted a mean potential saving of 73.5%, with several specific formulations exceeding 80%[22].

The present analysis demonstrates that generic substitution of psychotropic medications could lead to a substantial reduction in cumulative prescription costs by 78.7%, equivalent to a potential saving of ₹83,131. The estimated average cost per prescription could decrease from ₹206.34 to ₹44.04. This profound cost minimization underscores the significant economic burden imposed by branded psychotropic drugs and the immense potential for savings through the adoption of generic equivalents, without any assumed difference in clinical efficacy.

The overall analysis minimization analyses of psychotropic drugs demonstrated that generic substitution could reduce total cumulative reference costs from ₹1,05,633 to ₹22,502, indicating potential savings of ₹83,131 or 78.7%. Additionally, estimated average costs per prescription could decrease from ₹206.34 to ₹44.04, representing potential average savings of ₹162.30 per prescription.

Our findings are strongly corroborated by a growing body of Indian pharmacoeconomic research. A similar cost-minimization analysis conducted at the All India Institute of Medical Sciences (AIIMS), Jodhpur, Rajasthan, in 2021, focused on antipsychotics and mood stabilizers and found that switching from branded to generic drugs could result in cost savings ranging from 58.4% to 96.3%, with the average cost per patient per day decreasing significantly[23]. Further supporting this, a 2022 cross-sectional study from a tertiary care hospital in South India by Krishnamoorthy et al. evaluated and reported that the mean percentage price difference between branded and generic versions of psychotropic drugs was approximately 73%[24].

From a clinical and pharmacoeconomic perspective cost reductions are particularly important in psychiatry, where treatment is often long-term. Sustained affordability may improve adherence and reduce treatment interruption. At a policy level, these findings support formulary decisions and prescribing guidelines that prioritize generic psychotropic medications to achieve system-wide cost containment.

Conclusion

The present hospital-based cost-minimization analysis demonstrates that substitution of branded psychotropic medications with their generic equivalents could lead to substantial reductions in drug expenditure in outpatient psychiatric care. Significant potential cost savings were estimated across all major psychotropic drug classes and individual drugs, with an overall potential reduction of nearly four-fifths of the total prescription cost. The estimated decrease in average cost per prescription further supports the economic advantage of generic prescribing during routine outpatient visits.

Limitation :-

This was a single-center, outpatient-based cost-minimization analysis focusing only on direct drug costs during a single visit, which may limit generalizability and does not capture long-term treatment expenses. Potential savings from generic substitution were estimated using reference prices; actual substitution, patient expenditure and realized savings were not measured.

Conflict of interest

Authors declare no conflict of interest

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