

SHORT ARTICLE

A pharmaco-economic study on Jan Aushadhi generics versus branded pharmaceutical formulations in India

A. Anandhasayanam, S. Kannan, R. Rajamurugan

Department of Pharmacy practice, SSM College of pharmacy, Chinniampalayam Pudur, Tamil Nadu

CORRESPONDING AUTHOR

A Anandhasayanam, Professor, Department of Pharmacy practice, SSM College of pharmacy, Tamil Nadu 638312

Email: dranantha@yahoo.com

CITATION

Anandhasayanam A, Kannan S, Rajamurugan R. A pharmaco-economic study on Jan Aushadhi generics versus branded pharmaceutical formulations in India. Indian J Comm Health. 2024;36(3):478-484. <https://doi.org/10.47203/IJCH.2024.v36i03.023>

ARTICLE CYCLE

Received: 24/02/2024; Accepted: 08/06/2024; Published: 30/06/2024

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ABSTRACT

Background: Healthcare costs are a major burden on the society of developing countries like India. Countries like India try to limit healthcare costs in support of generic medicine. So, the Indian government initiated the Jan Aushadhi scheme in 2008 to provide high-quality generic medication at a low cost. **Aim:** The aim of the study was to compare the cost difference between Jan Aushadhi generic pharmaceutical formulations and branded medications in Tamil Nadu. **Settings and Design:** Pharmaco-economic - Cost minimization observational study. **Methods and Material:** Study Duration: Five months, from February 2023 to June 2023. **Study Place:** 10 Jan Aushadhi outlets from various districts of Tamil Nadu. **Sampling technique:** Convenience sampling technique **Statistical analysis used:** Mean median, mode and Percentage. **Results:** A total of 729 medications were available in 10 Jan Aushadhi outlets. The Jan Aushadhi outlet has the most cardiovascular medications and the fewest antimalarial medications among different categories of drugs. Erythropoietin has the biggest cost difference between the average cost of branded medications and Jan Aushadhi drug costs, while Digoxin has the lowest cost difference. Antitubercular drugs, Oxytocics, Antileprosy drugs, Antiparkinsonism categories of drugs also delisted in Jan Aushadhi outlet. **Conclusions:** Compared to branded drugs, Jan Aushadhi's generic drugs are 64.65 % less costly on an average as observed in our study. The manufacturer of Jan Aushadhi shops is a WHO and GMO-certified company, and they manufacture branded drugs. So, there will be no quality compromise in Jan Aushadhi's generic drugs.

KEYWORDS

Jan Aushadhi Outlets; Generic Drugs; Branded Drugs

INTRODUCTION

Drugs and medications comprise a considerable component of out-of-pocket (OOP) spending on well-being among families in India and are now a significant source of major expenses for both outpatient care and inpatient charges (1). A study demonstrates

that OOP payments for outpatient visits are primarily fulfilled via personal income and savings, emphasizing the problem of ability-to-pay as a factor of health-seeking behaviour for outpatient departments (2). Research over a period of four weeks indicated that 41%–56% of families polled in low- and middle-income

nations had only spent their health costs on drugs. Countries that sought to limit their spending and prevent the population from making OOP expenditures on medications created measures in support of generic medicine.(3) The Rangarajan committee reported that 29.5 percentage of the overall population remained below the poverty line in India.(4) India is the world's biggest supplier of generic medications and currently ranked third in pharmaceutical production.(5) Generic medications have the same effect as branded medications, are more affordable, and may result in decreased out-of-pocket costs for patients with any ailment.(6) The Government of India has been working to improve the people's acceptance of generics and the number of prescriptions that physicians write for them.(7) The Indian government's new "Jan Aushadhi" initiative was introduced in 2008 to provide everyone in India with high-quality generic medications at low costs. These have greatly benefited not only the poor but also middle-class people. The Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers, Government of India, introduced the "Jan Aushadhi Scheme" in November 2008. The 'Jan Aushadhi Scheme' was redesigned as the 'Pradhan Mantri Jan Aushadhi Yojana' (PMJAY) in September 2015. The programme was once again rebranded as "Pradhan Mantri Bhartiya Jan Aushadhi Pariyojana" (PMBJP) in November 2016 to give it more momentum. Through specialized outlets offering generic medications, which are offered at lower rates but are similar in quality and effectiveness to expensive branded treatments, the Jan Aushadhi project will make quality medications accessible at reasonable pricing(8). We aimed to analyse the cost difference between Jan Aushadhi generic pharmaceutical formulations and branded medications in 10 Jan Aushadhi outlets in Tamil Nadu. In this study, we don't calculate the cost difference of any particular category of drugs. This was the first study conducted in Jan Aushadhi Outlet that included cost differences for all categories of drugs.

Objectives:

- Understand the availability of generic formulations in Jan Aushadhi generic

outlets under various therapeutic segments.

- Compare the cost of Jan Aushadhi generics versus their branded equivalents in the retail market.
- Look at the drug categories that are most and least common in Jan Aushadhi outlet.
- Examine which medicine cost variances are the highest and lowest.
- Estimate the number of every type of dosage forms that is offered in the Jan Aushadhi outlets.
- Determine which categories are unlisted at every Jan Aushadhi outlet.
- Validate the claims made by Jan Aushadhi via its teasers to the public on the claims of being economical compared to its branded equivalents.
- Ascertain the quality certifications or background of the manufacturing companies of such generic formulations in Jan Aushadhi outlets.

MATERIAL & METHODS

Study Design: Pharmaco economic - Cost minimization observational study

Study Duration: Five months, from February 2023 to June 2023

Study Place: 10 Jan Aushadhi outlets from various districts of Tamil Nadu like Erode, Trichy, Thanjavur, Nammakal, and Salem. We included 3 outlets from Erode district, 2 outlets each from Trichy, Salem, Thanjavur, and 1 outlet from Nammakal.

Sampling technique: Convenient random sampling technique

Source of data: The purchase lists of Jan Aushadhi outlets, which cover all the medications available at particular outlets, were the source of all the data for the research. The Current Index of Medical Specialties, 1mg.com (9), Drug Today (January 2023 - March 2023)(10), the IDR 2021(11), and (CIMS, 2023)(12) were used to compare data on the prices of different branded pharmaceuticals with data on the pricing list of available generic drugs obtained from Jan Aushadhi Outlet(8).

Statistical analysis: Mean and Percentage. The data was entered into Microsoft excel and analysed.

Data collection procedure: After carefully explaining the study's objectives to the proprietor and the manager of the Jan Aushadhi outlets during our visit, we obtained their agreement before collecting the outlet's

drug inventory. Almost every pharmacy provides a 10-20% discount. So the Jan Aushadhi prices were compared to the average cost of branded medication after discounting 20%.

SI.No	Outlet number 1	Outlet number 2	Outlet number 10	Cost of branded drugs			Jan Aushadhi drug cost	20% discount on the average cost of branded drugs	Cost difference between Jan Aushadhi and branded formulations after 20% discount on MRP	Category
				High cost	Average cost	Low cost				
1	Paracetamol 500mg	-	Paracetamol 500mg	5.75	1.97	0.25	0.7	1.58	0.88	NSAIDs

Cost difference = Average branded drug cost – Jan Aushadhi drug cost

20% discount on the cost difference = Cost difference × 80/100

Subject selection:

Inclusion criteria: Jan Aushadhi outlet manager/owners, who gave consent

Exclusion criteria: Jan Aushadhi outlet manager/owners, who didn't give consent

RESULTS

A total of 729 medications were accessible across 10 Jan Aushadhi outlets (as shown in Table 1), encompassing various doses and dosage forms of the same drugs (for example, atorvastatin 5mg, 10mg, and 20mg were considered as 3 separate drugs). The majority of these medications were available at outlet number 1, whereas outlet number 6 had a more limited pharmaceutical selection. Nonetheless, only 454 distinct medications were present (for instance, atorvastatin 5mg, 10mg, and 20mg were considered as 1 single medication).

The classification of drugs based on system-wise availability in Jan Aushadhi is outlined in Table 2. Within these categories, the Jan Aushadhi outlet offered the highest number of cardiovascular medications (95), while the category with the fewest drugs was antimalarial medications (1).

Notably, Erythropoietin exhibited the largest cost disparity of Rs. 804.76 per injection between the average cost of branded medications and the corresponding Jan

Aushadhi drug costs. In contrast, Digoxin displayed the smallest cost difference of Rs. 0 per tablet.

The findings of our study indicated that the Jan Aushadhi software does not include categories of drugs like Anti-parkinsonism drugs, oxytocic drugs, Anti-leprosy drugs, and Anti-tubercular drugs.

The major finding of our research underscores that some of Jan Aushadhi's generic medications, such as Digoxin and Disodium Hydrogen Citrate Syrup have higher costs in comparison to the average prices of branded drugs, after 20% discount is applied. To illustrate, Digoxin was priced at Rs. 0.9 per tablet in Jan Aushadhi, whereas the branded Digoxin is obtainable at Rs. 0.8 per tablet with a 20% discount on the branded drug's average cost. Similarly, Disodium hydrogen citrate syrup was provided by Jan Aushadhi at a rate of Rs. 2.2/ml, whereas the branded Digoxin was accessible at a cost of Rs. 0.64/ml after applying a 20% discount on the branded drug's average cost.

Out of the 454 drugs, 389 are typically available in oral dosage forms, while only 2 are offered in nasal dosage forms (as presented in Table 3). Among the 454 medications, 82.16% are marketed as individual formulations, while the remaining 17.84% are available in combination formulations.

The veracity of claims made by Jan Aushadhi through pamphlets is confirmed (Picture 1). The prices of Jan Aushadhi drugs are notably

lower when compared to the average costs of branded drugs (as indicated in Table 4).

Manufacturers of Jan Aushadhi products, including AKUMS Drugs and Pharmaceuticals Ltd., BSV Pharma private Ltd., Biocon, Cadila Pharmaceuticals Ltd., CIPLA, FDC Pharma, Lupin Pharmaceuticals Ltd., Macleods Pharmaceuticals Ltd., Mankind Pharma, Micro Labs Ltd., Morepen Laboratories Ltd., MSN Laboratories Private Ltd., Synkem Pharmaceuticals Ltd., Troikaa Pharmaceuticals Ltd., Wockhardt Life Wins, Venus Remedies Ltd., Hetero Healthcare Ltd., and ZEE Laboratories Ltd., are certified by WHO and GMO. These manufacturers produce branded drugs, indicating that there is no compromise in quality for Jan Aushadhi's generic drugs.

DISCUSSION

At present, there are 9082 operational PMBJP Kendras across the nation, except for Lakshadweep. Every state and union territory now boasts Jan Aushadhi outlets, with Uttar Pradesh leading with the highest number of outlets (1293), surpassing all others. Conversely, Ladakh has recently established only 2 outlets, marking the lowest count. Tamil Nadu has expanded its outlets by 859, securing its position as the fourth-largest in terms of outlet numbers. Within Tamil Nadu, Chennai district hosts 126 outlets, while Mayiladudurai district has just 1. Moreover, 36 distributors have been enlisted to serve states and union territories. However, distributors weren't available in several states and union territories, including Andhra Pradesh, Assam, Bihar, Andaman and Nicobar Islands, Dadar and Nagar Haveli and Daman and Diu, Goa, Haryana, Ladakh, Lakshadweep, Madhya Pradesh, Meghalaya, Mizoram, Pondicherry, Sikkim, and Telangana. As of today, there were 1759 pharmaceutical products accessible, along with 280 surgical supplies and medical equipment (13).

According to the WHO's India report, males experience higher age-adjusted CVD death rates compared to females. The report highlights that there were 349 males with CVD per 100,000 men, while for every 100,000 men, 265 females had CVD(14). Unfortunately, only 12% of the reported 220 million

hypertensive individuals in India have their blood pressure under control(15). A pharmaco-economic study unveiled significant differences in the cost of Jan Aushadhi scheme drugs and branded drugs accessible in India for antihypertensive treatment(16). Similarly, another study conducted at a Jan Aushadhi outlet found that the cost of generic drugs for dyslipidemic treatment is lower compared to branded drugs(17). However, a separate study focusing on the cost analysis of drugs used for respiratory and gastrointestinal diseases concluded that the price disparities for branded drugs were notably higher in comparison to Jan Aushadhi's generic drugs(18).

According to our study, there was a significant cost difference between generic drugs and average cost branded drugs. Another pharmaco-economic study conducted at Jan Aushadhi Kendra in Jharkhand concluded that Jan Aushadhi generic drugs were less expensive compared to branded drugs (19). Some pharmaco-economic studies conducted in various chemotherapy (20,21) and chemoradiation regimens concluded that generic drugs were less costly and reduced the expense of patients who used this drug to treat neck and head cancer (22).

There were five antipsychotic drugs available in the Jan Aushadhi outlet. The overall cost difference between the average cost of branded drugs after 20% discount and generic drugs is Rs. 4.93/per tablet. A cost variation analysis conducted on commonly prescribed oral antipsychotic drugs concluded that the percentage cost variation between branded and generic drugs ranged from 400-1050% (23).

Among the 37 antibiotics, five were quinolones. Those Jan Aushadhi prices were 56.6% less costly as compared to average brand prices after 20% discount. Another study about the cost analysis of quinolones concluded that Jan Aushadhi quinolones were cheaper than branded drugs (24).

The second-most prevalent neurodegenerative condition in people over the age of 60 is Parkinson's disease(25). According to the Global Burden of Disease report from 2018, there were 2.5 million

people with Parkinson's disease around the globe in 1990. By 2016, that number had increased to 6.1 million (26). Certain drug categories such as Anti-parkinsonism drugs, oxytocic drugs, Anti-leprosy drugs, and Anti-tubercular drugs, are specified in the National Essential Drug List 2022 (27), yet they are not incorporated into the software (8) used by Jan Aushadhi outlets.

A study conducted by Tanna et al. on generic medicines shows that only 25% of people said that generic medicine is as effective as branded medicine and generic medicines have a lower cost because of 50% company reputation, 30% low quality and 20% lesser therapeutic effect (28). Another study conducted by Nagarajappa et al. concluded that 'doctor's prescription', 'lower price', 'availability of Jan Aushadhi outlets', 'quality of generic medicine' and 'recommendation from others' had a significant influence on acceptance of Jan Aushadhi (29). Another study conducted by Arunkumar R et al. concluded that cost and quality, promotional activities, customer awareness, and customer psychology and availability of required medicines in Jan Aushadhi medical outlets were the key factors influencing customers buying behaviour (30).

According to Shadiq S et al. 2017, 83.3% of doctors do not recommend generic medications, and 93.3% fail to educate patients about Jan Aushadhi schemes (31). In their 2016 survey of physicians, Patel et al. found that physicians had mixed feelings regarding the safety, efficacy, and adoption of good manufacturing practices by generic manufacturers. Generic medication takes a long time to reduce the total cost of healthcare while also relieving symptoms(32).

Deshpande et al. 2018, which examined the operation and productivity of JAS, 84.62% of the owners indicated that the Jan Aushadhi outlet's only net profit was less than 5000 rupees, and 66.27% said that fewer than 20 prescriptions were received daily (33).

This study concluded that compared to the average cost of branded drugs with a 20% discount, Jan Aushadhi's generic drugs are 55.81% less expensive. Compared to the

average price of branded drugs without a 20% discount, Jan Aushadhi's generic drugs are 64.65% less expensive. A large number of drug categories are provided in Jan Aushadhi's scheme. However, several categories such as Anti-parkinsonism medications, oxytocic drugs, Anti-leprosy drugs, and anti-tubercular drugs, are not included. The cardiovascular category of medications has the most drugs offered in Jan Aushadhi, while the anti-malarial category has the fewest drugs. The most significant cost difference between branded medications and Jan Aushadhi pharmaceuticals is found in erythropoietin, while the lowest cost difference is found in digoxin. 85.68% of the pharmaceuticals are accessible in oral dosage form, while 82.16% of the drugs are available as individual medications.

Feedback About Jan Aushadhi Outlets Collected from Jan Aushadhi Pharmacists

Positive feedback:

- Less patient burden
- Less costly

Negative feedback:

- Low margin
- Main drawbacks is that expired generic drugs aren't getting return back by the distributor of Jan Aushadhi.
- Delivery delays
- Advance payments for orders

Feedback About Jan Aushadhi Outlets Collected from Common Public and Customer of Jan Aushadhi Outlets:

Positive feedback:

- Cost savings

Negative feedback:

- Less number of outlets.
- In general, clinicians don't prescribe generic drugs
- Lack of knowledge about Jan Aushadhi outlets
- Drugs that are not available are listed in the software
- Unavailability of different doses of drugs

Feedback About Jan Aushadhi Outlets Collected from Physicians:

Positive feedback

- Patients with chronic conditions from economically poor backgrounds are referred to Jan Aushadhi

Negative feedback:

- Less faith in generic medicines with doubts on their quality, though the generic drugs are manufactured at the same facilities as those of branded drugs.
- Unavailability of some drugs in Jan Aushadhi outlets

Suggestions For Problem Related To Jan Aushadhi:

- The prescriber should prescribe medicine under its generic name.
- Improve the supply chain by increasing the number of distributors.
- Should create awareness among people that generic drugs are of the same quality as branded drugs.
- Ensure the availability of all products in Jan Aushadhi outlets.
- Outlets should buy medicines as per patients' needs in that locality.
- Based on population and area, should open number of outlets.

RECOMMENDATION

- Open a Jan Aushadhi outlet in Lakshadweep because there are no outlets available in Lakshadweep(21).
- Open so many outlets will compete with private outlets.
- Should increase the opening of Jan Aushadhi outlets in every government hospital.
- Nearly half of the states and Union territories don't have distributors. Make sure there is a distributor in those states(21).
- Want to increase the availability of all categories of drugs.
- If the drug was expired, the distributor needs to collect the expired drugs from all Jan Aushadhi outlets.
- To conduct awareness camps for physicians about the quality and efficacy of JAS generic medicine

LIMITATION OF THE STUDY

This study was conducted in select districts of Tamil Nadu, rather than across all of India

RELEVANCE OF THE STUDY

This study is very much related to low cost drug

AUTHORS CONTRIBUTION

All authors have contributed equally.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil

CONFLICT OF INTEREST

There are no conflicts of interest.

DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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