

Research Article

A Cross-Sectional Study to Assess the Knowledge, Attitude and Practices Regarding Generic Medicines Among Patients and Healthcare Professionals at a Tertiary Care Teaching Hospital

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ABSTRACT

Background: Generic medicines are therapeutically equivalent, lower-cost alternatives to innovator brands and are central to improving access to treatment in India, where a large share of health spending is paid out of pocket. Their uptake, however, depends on how patients, prescribers, pharmacists and nurses understand and perceive them.

Objectives: To assess the knowledge, attitude and practices (KAP) regarding generic medicines among patients and healthcare professionals (HCPs) at a tertiary care teaching hospital, and to identify factors associated with knowledge.

Methods: A hospital-based, cross-sectional, questionnaire-based study was conducted over six months among 200 outpatients and 200 HCPs (100 doctors, 60 nurses and 40 pharmacists) selected by convenience sampling. Validated, pre-tested, structured questionnaires were used. Knowledge, attitude and practice were scored and categorised. Data were analysed with SPSS version 25 using descriptive statistics and the chi-square test; $p < 0.05$ was considered significant.

Results: The mean age of patients was 41.6 ± 13.8 years and 54.0% were male. Although 69.0% of patients had heard of generic medicines, only 21.0% had good knowledge, 42.0% had a positive attitude, and 52.0% had ever used a generic medicine. Higher education ($p < 0.001$) and urban residence ($p = 0.023$) were significantly associated with good knowledge. Among HCPs, 58.5% had good knowledge and 64.0% had a positive attitude; knowledge differed significantly by profession (pharmacists 77.5%, doctors 62.0%, nurses 40.0%; $p = 0.004$). Only 38.0% of doctors always prescribed by generic name. The commonest barriers were doubts about quality (37.0%), non-availability in the hospital pharmacy (33.0%) and habit (30.0%).

Conclusion: Knowledge of generic medicines is inadequate among patients and uneven among HCPs, and concerns about quality and availability continue to limit generic use. Structured counselling, continuing education for HCPs, assured quality and reliable availability of generics are needed to translate policy intent into practice.

Keywords: Generic Medicines, Knowledge, Attitude and Practice, Patients, Healthcare Professionals, Tertiary Care Hospital, India.

INTRODUCTION

Medicines are among the most cost-effective interventions in healthcare, yet their cost remains a major barrier to treatment for millions of people. The World Health Organization (WHO) describes a generic medicine as a pharmaceutical product, usually intended to be interchangeable with an innovator product, that is manufactured without a licence from the innovator company and marketed after the expiry of the patent or other exclusive rights [1,2]. Because generic manufacturers do not have to repeat the costly

preclinical and clinical development of the originator, generics are usually sold at a fraction of the brand price, and wider use of generics has been repeatedly proposed as a practical way of improving access to essential medicines and containing health expenditure [1,3,4].

The scientific case for generics is strong. Regulators require a generic product to contain the same active ingredient, strength, dosage form and route of administration as the reference product and to demonstrate bioequivalence, which is generally accepted

when the 90% confidence intervals of the ratios of the area under the curve and peak concentration fall within 80% to 125% of the reference product [4]. In India, bioequivalence and quality requirements for new and generic formulations are specified under the Drugs and Cosmetics Act and the New Drugs and Clinical Trials Rules, 2019 [5]. A systematic review and meta-analysis of cardiovascular drugs found no evidence that brand-name products were clinically superior to their generic counterparts [6].

Despite this evidence, the acceptance of generics depends heavily on perception rather than pharmacology. Reviews of stakeholder opinion show that patients frequently equate a lower price with lower quality, doubt that generics work as well as brands, and are wary when the colour, shape or packaging of a familiar medicine changes [7,8,9,10]. Studies from other countries have also found gaps in the knowledge of general practitioners and consumers and have shown that doctors' prescribing habits, patient requests and marketing influence whether generics are actually used [11,12,13]. Where generic use is encouraged, prescribing generics has been associated with better adherence to chronic therapy, probably because of lower out-of-pocket costs [14].

India is one of the largest producers and exporters of generic medicines in the world, yet the domestic situation is paradoxical. Medicines account for the largest share of household out-of-pocket health expenditure in India [15]. Surveys of prices and availability have documented that essential medicines are often unavailable in public facilities, pushing patients to buy from private retail outlets at higher prices [16,17,18]. The Indian market is also dominated by branded generics, and the very large number of look-alike and sound-alike brand names creates confusion for prescribers and patients alike [19]; even for the same manufacturer, prices of branded and branded-generic versions can differ considerably [20].

To address these issues, the Government of India has introduced several measures. The Medical Council of India directed registered practitioners to prescribe drugs by their generic names, a requirement reinforced through its 2016 regulations [21]. The Pradhan Mantri Bhartiya Janaushadhi Pariyojana (Jan Aushadhi Scheme) has set up dedicated outlets that sell quality-assured generic medicines at low prices [22], and the National List of Essential

Medicines provides a basis for rational procurement and prescribing [23]. The success of these policies, however, rests on the people at the point of care: doctors who prescribe, pharmacists who dispense and counsel, nurses who interact closely with patients, and patients who ultimately accept or reject the medicine [24,25].

Most published work has examined either consumers or prescribers separately, and data comparing the two groups in the same tertiary care teaching hospital are limited. Understanding where patients and HCPs agree and where they differ can help in designing targeted interventions. The present study was therefore undertaken to assess the knowledge, attitude and practices regarding generic medicines among patients and healthcare professionals at a tertiary care teaching hospital, to compare the two groups, and to identify factors associated with knowledge of generic medicines.

MATERIALS AND METHODS

Study Design and Setting

This was a hospital-based, observational, cross-sectional, questionnaire-based study carried out at Ram Krishna Medical College Hospital & Research Centre, a tertiary care teaching hospital in Bhopal, India. The study was conducted over a period of six months, from January 2026 to June 2026. Patients were approached in the outpatient departments of General Medicine, Surgery, Paediatrics, Obstetrics and Gynaecology, and Orthopaedics, while healthcare professionals were approached in their respective departments and in the hospital pharmacy.

Study Population

Two groups were studied. Group A comprised adult outpatients, and Group B comprised healthcare professionals, namely doctors (faculty members, senior residents and postgraduate residents), staff nurses and pharmacists working at the hospital.

Inclusion Criteria: (i) patients aged 18 years or above who attended the outpatient departments and had purchased or been prescribed medicines at least once in the previous year; (ii) doctors, nurses and pharmacists with at least six months of service in the institution; and (iii) willingness to participate and provide written informed consent.

Exclusion Criteria: (i) patients who were critically ill, had cognitive impairment or were unable to communicate; (ii) interns, students and trainee pharmacists; (iii) persons employed by pharmaceutical companies; and (iv) those who declined consent or returned incomplete questionnaires.

Sample Size and Sampling Technique

The sample size was calculated using the formula $n = Z^2pq/d^2$, where $Z = 1.96$ at the 95% confidence level, p is the expected proportion with adequate knowledge and d is the absolute precision [26]. In the absence of a comparable local estimate, p was taken as 50% and d as 7%, which gave a minimum of 196 participants for each group. A sample of 200 patients and 200 healthcare professionals (total 400) was therefore enrolled. Participants were recruited by convenience sampling. Among the HCPs, quota-based recruitment was used to ensure representation of doctors ($n = 100$), nurses ($n = 60$) and pharmacists ($n = 40$).

Study Instruments

Two separate, structured, self-administered questionnaires in English and Hindi (patients) and in English (HCPs) were developed after reviewing the available studies. Each questionnaire had four sections: (a) socio-demographic and professional details, (b) knowledge items, (c) attitude items, and (d) practice items. Knowledge and practice items were answered as 'yes', 'no' or 'don't know', and attitude items were rated on a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. For presentation, 'agree' and 'strongly agree' were combined as agreement. Content and face validity were established by five experts from the departments of Pharmacology, General Medicine and Community Medicine. The patient questionnaire was translated into Hindi and back-translated into English to check consistency. A pilot test on 20 patients and 15 HCPs, who were not included in the final analysis, was used to check clarity and to estimate the time needed for completion. Internal consistency was good (Cronbach's alpha 0.78 for the patient tool and 0.81 for the HCP tool). Patients with low literacy were assisted by a trained investigator who read out the questions without influencing the responses.

Scoring and Operational Definitions

Each correct knowledge response scored one mark and incorrect or 'don't know' responses scored zero. The patient knowledge score (maximum 8) was categorised as good (6 to 8), moderate (4 to 5) or poor (0 to 3). The HCP knowledge score (maximum 8) was categorised as good (6 to 8), moderate (4 to 5) or poor (0 to 3). Attitude statements were scored from 1 to 5, with negatively worded statements reverse-scored; the total score was expressed as a percentage of the maximum and categorised as positive (70% or above), neutral (50% to 69%) or negative (below 50%). Practice was described by the proportion of participants who reported each behaviour.

Data Collection and Ethical Considerations

Eligible participants were briefed about the purpose of the study, assured of anonymity and confidentiality, and asked to sign a written informed consent form. No personal identifiers were recorded. The questionnaire took about 10 to 15 minutes to complete. The study was approved by the Institutional Ethics Committee (Approval No. [IEC/2026/183]) and was conducted in accordance with the Declaration of Helsinki and the National Ethical Guidelines of the Indian Council of Medical Research [27,28].

Statistical Analysis

Data were entered in Microsoft Excel and analysed using IBM SPSS Statistics version 25.0. Categorical variables were expressed as frequencies and percentages, and continuous variables as mean $\pm$ standard deviation. The chi-square test (or Fisher's exact test when expected cell counts were below five) was used to compare proportions between groups and to examine the association between socio-demographic variables and knowledge category. A p value of less than 0.05 was considered statistically significant.

RESULTS

A total of 420 questionnaires were distributed, of which 400 complete responses (200 from patients and 200 from HCPs) were analysed, giving an overall response rate of 95.2%.

Socio-Demographic Characteristics of the Participants

The mean age of the 200 patients was 41.6 ± 13.8 years, and 108 (54.0%) were males. More than one-third of the patients (35.0%) were aged 31 to 45 years, 56.0% lived in urban

areas, and 47.0% were suffering from a chronic illness for which they were on long-term medication. Only 11.0% were illiterate, and 34.0% were graduates or postgraduates.

Nearly two-thirds of patients (68.0%) belonged to families with a monthly income of up to INR 25,000 (Table 1).

Table 1: Socio-Demographic Characteristics of Patients (N = 200)

Characteristic	Frequency (n)	Percentage (%)
Age group (years)		
18 - 30	46	23.0
31 - 45	70	35.0
46 - 60	56	28.0
Above 60	28	14.0
Gender		
Male	108	54.0
Female	92	46.0
Education		
Illiterate	22	11.0
Primary / middle school	58	29.0
Higher secondary	52	26.0
Graduate	48	24.0
Postgraduate	20	10.0
Residence		
Urban	112	56.0
Rural	88	44.0
Monthly family income (INR)		
Up to 10,000	54	27.0
10,001 - 25,000	82	41.0
25,001 - 50,000	44	22.0
Above 50,000	20	10.0
Chronic illness on long-term medication		
Yes	94	47.0
No	106	53.0

Values are frequency and percentage; percentages are of the total (n = 200) in each category.

Among the 200 HCPs, 100 (50.0%) were doctors (45 faculty members and 55 residents),

60 (30.0%) were nurses and 40 (20.0%) were pharmacists. The mean age was 34.2 ± 8.1 years, 104 (52.0%) were males, and 34.0% had more than 10 years of professional experience (Table 2).

Table 2: Characteristics of Healthcare Professionals (N = 200)

Characteristic	Frequency (n)	Percentage (%)
Profession		
Doctors	100	50.0
Nurses	60	30.0
Pharmacists	40	20.0
Gender		
Male	104	52.0
Female	96	48.0
Professional experience		
Less than 5 years	74	37.0
5 - 10 years	58	29.0
More than 10 years	68	34.0

Doctors: 45 faculty members and 55 senior/postgraduate residents.

Knowledge, Attitude and Practices of Patients

Knowledge: Although 138 patients (69.0%) had heard of the term 'generic medicine', understanding of the concept was limited. Fewer than half knew that generics contain the same active ingredient (48.0%) or the same strength (45.0%) as the brand, and only 42.0% believed that they are equally effective. About

three-quarters (76.0%) correctly knew that generics are cheaper, but only 39.0% were aware that generics are quality tested and approved by the regulator, and 44.0% were aware of Jan Aushadhi Kendras (Table 3). The mean knowledge score was 4.1 ± 2.2 out of 8. Overall, 42 patients (21.0%) had good, 76 (38.0%) moderate and 82 (41.0%) poor knowledge.

Table 3: Knowledge of Patients Regarding Generic Medicines (N = 200)

Knowledge statement	Correct response, n (%)
Have heard of generic medicines	138 (69.0)
Generics contain the same active ingredient as brands	96 (48.0)
Generics have the same dose / strength as brands	90 (45.0)
Generics are equally effective as brands	84 (42.0)
Generics are cheaper than brands	152 (76.0)
Generics are quality tested / approved by the regulator	78 (39.0)
Generics are sold under chemical (non-proprietary) names	102 (51.0)
Aware of Jan Aushadhi Kendras	88 (44.0)
Overall knowledge level	
Good (score 6 - 8)	42 (21.0)
Moderate (score 4 - 5)	76 (38.0)
Poor (score 0 - 3)	82 (41.0)

Mean knowledge score = 4.1 ± 2.2 (maximum 8).

Attitude: Attitudes were mixed (Table 4). While 78.0% of the patients were willing to buy a generic medicine if it was cheaper and 74.0% would accept one if their doctor prescribed it, 49.0% felt that generics are of lower quality because they cost less, and 59.0% preferred brands for serious illnesses. Nearly half

(46.0%) believed that generics act more slowly or are less effective, and only 36.0% supported substitution of a prescribed brand with a generic by the pharmacist. Most patients (82.0%) agreed that the government should promote generics. On the overall attitude score, 84 patients (42.0%) had a positive, 66 (33.0%) a neutral and 50 (25.0%) a negative attitude.

Table 4: Attitude of Patients Towards Generic Medicines (N = 200)

Attitude statement	Agree, n (%)
Generics are as safe as branded medicines	86 (43.0)
Generics are of lower quality because they are cheaper	98 (49.0)
Generics work more slowly / are less effective than brands	92 (46.0)
I prefer brand-name medicines for serious illnesses	118 (59.0)
I will accept a generic if my doctor prescribes it	148 (74.0)
I will buy a generic medicine if it is cheaper	156 (78.0)
Pharmacists should be allowed to substitute a brand with a generic	72 (36.0)
Government should promote the use of generic medicines	164 (82.0)
Overall attitude	
Positive	84 (42.0)
Neutral	66 (33.0)
Negative	50 (25.0)

Practice: A little over half of the patients (52.0%) had ever used a generic medicine and 41.0% were using one at the time of the survey. Only 23.0% had ever asked their doctor

about a generic alternative, whereas 37.0% had asked the pharmacist for a cheaper equivalent. Twenty-nine percent had bought medicines from a Jan Aushadhi Kendra, and

32.0% reported that their last prescription was written by generic name. Notably, 24.0% had skipped or reduced doses because of the cost of medicines. The doctor was the commonest

source of information about generics (39.0%), followed by the pharmacist (26.0%), the media or internet (20.0%) and family or friends (15.0%) (Table 5).

Table 5: Practices of Patients Regarding Generic Medicines (N = 200)

Practice	Yes, n (%)
Have ever used a generic medicine	104 (52.0)
Currently using a generic medicine	82 (41.0)
Asked the doctor for a generic alternative	46 (23.0)
Asked the pharmacist for a cheaper equivalent	74 (37.0)
Purchased medicines from a Jan Aushadhi Kendra	58 (29.0)
Last prescription was written by generic name	64 (32.0)
Skipped or reduced doses because of cost	48 (24.0)
Main source of information about generics	
Doctor	78 (39.0)
Pharmacist	52 (26.0)
Media / internet	40 (20.0)
Family / friends	30 (15.0)

Factors Associated with Patients' Knowledge

Good knowledge was significantly more frequent among graduates and postgraduates than among less-educated patients (41.2% vs. 10.6%; $p < 0.001$) and among urban than rural residents (26.8% vs. 13.6%; $p = 0.023$).

Patients with a monthly family income above INR 25,000 had a higher proportion of good knowledge than those with lower income (28.1% vs. 17.6%), but the difference was not statistically significant ($p = 0.090$). Age group and gender were not associated with knowledge (Table 6).

Table 6: Association of Socio-Demographic Factors with Good Knowledge Among Patients (N = 200)

Variable	Good knowledge, n (%)	Not good, n (%)	Chi-square	p value
Education				
Graduate and above (n = 68)	28 (41.2)	40 (58.8)	25.28	< 0.001*
Below graduate (n = 132)	14 (10.6)	118 (89.4)		
Residence				
Urban (n = 112)	30 (26.8)	82 (73.2)	5.14	0.023*
Rural (n = 88)	12 (13.6)	76 (86.4)		
Monthly family income				
Above INR 25,000 (n = 64)	18 (28.1)	46 (71.9)	2.88	0.090
INR 25,000 or below (n = 136)	24 (17.6)	112 (82.4)		

*Statistically significant (chi-square test, $p < 0.05$).

Knowledge, Attitude and Practices of Healthcare Professionals

Knowledge: Most HCPs (83.0%) could correctly define a generic medicine and 79.0% were aware of the Jan Aushadhi scheme. However, only 62.0% knew the concept of bioequivalence and its accepted 80% to 125% limits, and just 56.0% could distinguish a true

generic from a branded generic (Table 7). Overall, 117 HCPs (58.5%) had good, 63 (31.5%) moderate and 20 (10.0%) poor knowledge. Knowledge differed significantly by profession: good knowledge was found in 77.5% of pharmacists, 62.0% of doctors and 40.0% of nurses (chi-square = 15.48, $df = 4$, $p = 0.004$) (Table 8).

Table 7: Knowledge of Healthcare Professionals Regarding Generic Medicines (N = 200)

Knowledge statement	Correct response, n (%)
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Correctly defined a generic medicine	166 (83.0)
Know that generics must show bioequivalence with the reference product	132 (66.0)
Know the accepted bioequivalence limits (80 - 125%)	124 (62.0)
Know that generics must meet the same quality standards (GMP / IP)	150 (75.0)
Can differentiate a true generic from a branded generic	112 (56.0)
Aware of the directive on prescribing by generic name	146 (73.0)
Aware of the Jan Aushadhi scheme (PMBJP)	158 (79.0)
Aware of the National List of Essential Medicines	138 (69.0)

Table 8: Level Of Knowledge of Generic Medicines by Profession (N = 200)

Profession	Good, n (%)	Moderate, n (%)	Poor, n (%)	Total
Doctors	62 (62.0)	30 (30.0)	8 (8.0)	100
Nurses	24 (40.0)	26 (43.3)	10 (16.7)	60
Pharmacists	31 (77.5)	7 (17.5)	2 (5.0)	40
Total	117 (58.5)	63 (31.5)	20 (10.0)	200

Chi-square = 15.48, df = 4, p = 0.004.

Attitude: A majority of HCPs agreed that generics are safe (75.0%), equally effective (71.0%) and reduce the cost of treatment (89.0%) (Table 9). Nonetheless, 59.0% expressed concern about the quality of some generic products, 48.0% felt that brand names are easier to remember, and 44.0% agreed that promotional activity by pharmaceutical companies influences prescribing. Just over half

(52.0%) supported pharmacist-led generic substitution, and 63.0% favoured stricter enforcement of generic prescribing. A positive attitude was seen in 128 HCPs (64.0%), a neutral attitude in 46 (23.0%) and a negative attitude in 26 (13.0%). Positive attitude was found in 68.0% of doctors, 55.0% of nurses and 67.5% of pharmacists; this difference was not significant (p = 0.221).

Table 9: Attitude of Healthcare Professionals Towards Generic Medicines (N = 200)

Attitude statement	Agree, n (%)
Generics are as safe as branded medicines	150 (75.0)
Generics are as effective as branded medicines	142 (71.0)
Prescribing generics reduces the cost of treatment	178 (89.0)
I have concerns about the quality of some generic medicines	118 (59.0)
Brand names are easier to remember and prescribe	96 (48.0)
Promotion by pharmaceutical companies influences prescribing	88 (44.0)
Pharmacists should be allowed to substitute a brand with a generic	104 (52.0)
Generic prescribing should be strictly enforced	126 (63.0)
Overall attitude	
Positive	128 (64.0)
Neutral	46 (23.0)
Negative	26 (13.0)

Practice: Among the 100 doctors, 38 (38.0%) reported that they always prescribe by generic name, 42 (42.0%) did so sometimes and 20 (20.0%) never did. Counselling of patients about generic medicines was reported by 135 of 200 HCPs (67.5%), and was significantly more frequent among pharmacists (90.0%)

than doctors (71.0%) and nurses (46.7%) (p < 0.001). The main reasons given for not prescribing or recommending generics were doubts about quality (37.0%), non-availability of generics in the hospital pharmacy (33.0%), habit (30.0%), patient insistence on brands (26.0%) and the influence of medical representatives (19.0%) (Table 10).

Table 10: Practices of Healthcare Professionals and Barriers to Use of Generics (N = 200)

Practice / barrier	n (%)
Prescribing by generic name (doctors, n = 100)	
Always	38 (38.0)
Sometimes	42 (42.0)
Never	20 (20.0)
Counsel patients about generic medicines	
Doctors (n = 100)	71 (71.0)
Nurses (n = 60)	28 (46.7)
Pharmacists (n = 40)	36 (90.0)
All HCPs (n = 200)	135 (67.5)
Barriers to prescribing / recommending generics (multiple responses, n = 200)	
Doubts about quality of generics	74 (37.0)
Non-availability in the hospital pharmacy	66 (33.0)
Habit of prescribing brands	60 (30.0)
Patient insistence on brands	52 (26.0)
Influence of medical representatives	38 (19.0)

Counselling by profession: chi-square = 21.66, df = 2, p < 0.001.

Comparison Between Patients and Healthcare Professionals

HCPs had significantly better knowledge than patients (good knowledge 58.5% vs. 21.0%). On the items common to both questionnaires, a significantly higher proportion of HCPs agreed that generics are equally effective (71.0% vs. 42.0%), are as safe as brands (75.0% vs.

43.0%) and are cheaper (89.0% vs. 76.0%). HCPs were also more likely to support pharmacist substitution (52.0% vs. 36.0%). Concerns about quality were, however, expressed by a significantly larger proportion of HCPs than patients (59.0% vs. 49.0%) (Table 11, Figure 1).

Table 11: Comparison of Selected Responses Between Patients and Hcps

Statement	Patients (n = 200)	HCPs (n = 200)	Chi-square	p value
Generics are equally effective	84 (42.0)	142 (71.0)	34.22	< 0.001*
Generics are as safe as brands	86 (43.0)	150 (75.0)	42.33	< 0.001*
Generics are cheaper / reduce cost	152 (76.0)	178 (89.0)	11.71	0.001*
Concern about quality of generics	98 (49.0)	118 (59.0)	4.03	0.045*
Support pharmacist substitution	72 (36.0)	104 (52.0)	10.39	0.001*

*Statistically significant (chi-square test with continuity correction not applied, p < 0.05).

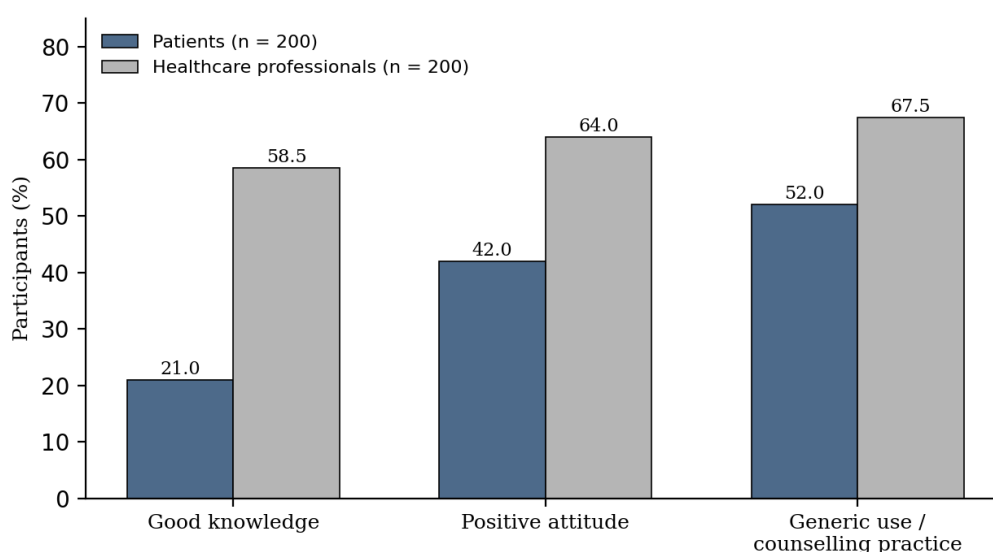


Figure 1: Overall, Knowledge, Attitude and Practice of Patients and Healthcare Professionals.

Practice = ever used generics (patients) and counselling patients about generics (HCPs).

DISCUSSION

Generic medicines can only deliver savings if the people who prescribe, dispense and consume them understand and trust them. This study examined knowledge, attitude and practices regarding generics in two groups at the same tertiary care teaching hospital. The main findings were a clear knowledge deficit among patients, an uneven level of knowledge among HCPs, a generally favourable but cautious attitude in both groups, and practices that lagged behind policy, with concerns about quality and availability emerging as the major barriers.

Although about 69% of our patients had heard of generic medicines, only 21.0% had good knowledge and fewer than half knew that generics contain the same active ingredient or are equally effective. Awareness of the term without an understanding of its meaning has been a consistent finding in consumer surveys from both developed and developing countries [2,7,12]. Patients in our study were most aware of the one feature that is obvious to them, namely that generics are cheaper (76.0%), while much less aware of quality assurance (39.0%), mirroring the tendency of consumers to judge medicines by price and appearance [9,10]. Awareness of Jan Aushadhi Kendras (44.0%) was lower than might be expected given the national scale of the programme [22], suggesting that information about the scheme has not yet reached many patients, particularly those in rural areas.

Education and urban residence were the factors significantly associated with good knowledge in our sample. Educated patients can more easily read prescriptions and labels, access printed and online information, and ask questions of their doctor, whereas illiterate and rural patients rely largely on the prescriber and the chemist. This socio-economic gradient is important in India, where medicines account for the largest component of out-of-pocket spending [15] and where the poorest households stand to gain the most from low-cost generics. The absence of a statistically significant effect of income in our study should be interpreted cautiously because the sample was modest.

Among HCPs, 83.0% could correctly define a generic medicine, but knowledge of the scientific basis of equivalence was weaker: only 62.0% were familiar with bioequivalence limits and 56.0% could distinguish true generics from branded generics. Gaps in prescriber knowledge about generics have been described in other settings [11,29], and in India the problem is compounded by the large number of branded generics sold under proprietary names that resemble true generics [19,20]. Pharmacists scored highest, which is expected because pharmaceuticals and drug regulation form a core part of their training, whereas nurses had the lowest scores. Nurses are rarely included in educational programmes on rational drug use but they spend the most time with patients and are often asked about medicines;

they therefore represent an under-used channel for patient education.

The attitudes of patients were ambivalent. A large majority were willing to buy a generic if it was cheaper (78.0%) or if their doctor recommended it (74.0%), indicating that the doctor's advice is the strongest determinant of acceptance. At the same time, 49.0% associated low price with low quality and 59.0% preferred brands for serious illness. Similar beliefs that generics are inferior, act slowly or have more side effects have been documented repeatedly in systematic reviews of consumer opinion [7,8]. These perceptions are not supported by evidence of clinical equivalence between brand and generic products [4,6] but they are persistent and have real consequences: patients who doubt a medicine may not take it as prescribed. Only 36.0% of patients supported pharmacist substitution, which suggests that trust in the pharmacist as an independent decision-maker is still limited and that substitution policies would need to be accompanied by counselling.

Most HCPs agreed that generics are safe (75.0%) and effective (71.0%) and that they lower costs (89.0%). It is noteworthy, however, that 59.0% still had concerns about the quality of some generics, a figure significantly higher than that among patients. This should not be dismissed as simple prejudice. In India there is a wide range of manufacturers, and the HCPs' doubts may reflect real concerns about batch-to-batch quality and the credibility of unbranded products, in a market where quality-assurance mechanisms are perceived as uneven [17,20]. Concerns about narrow therapeutic index drugs have also been reported among physicians elsewhere [29]. Restoring professional confidence will therefore require visible, trustworthy quality assurance, such as publication of test results and procurement only from certified manufacturers, rather than education alone. About 44.0% of HCPs agreed that promotional activity influences prescribing, and 48.0% found brand names easier to remember, which highlights how habit and marketing sustain brand prescribing [13,24].

Only about half of our patients (52.0%) had ever used a generic medicine and 32.0% reported that their last prescription was written by generic name. Notably, almost a quarter (24.0%) had skipped or reduced doses of medicines because of cost, and fewer than one in four had ever asked their doctor about a

cheaper alternative. These findings reflect the high financial burden of medicines in India and the disproportionate reliance of patients on private purchase when public supply fails [15,16,18]. Because adherence improves when lower-cost generic options are prescribed [14], the failure to discuss generics during the consultation represents a missed opportunity. The doctor was the main source of information (39.0%), followed by the pharmacist (26.0%), again confirming that a short, clear explanation by the prescriber can strongly influence patient acceptance.

Among doctors, only 38.0% always prescribed by generic name, in spite of the regulatory directive that doctors should prescribe generic names [21], and 73.0% of HCPs were aware of this directive. The gap between awareness and compliance suggests that regulation alone is insufficient. The barriers named by our respondents (quality doubts, non-availability, habit, patient demand and company influence) are similar to those reported from other countries that have promoted generic use [24,25]. Non-availability of generics in the hospital pharmacy (33.0%) is especially relevant: no prescriber can write a generic name with confidence if the medicine is not stocked. Studies from Delhi and from North Indian states have shown that the availability of essential medicines in public facilities is often inadequate [17,18], and our findings suggest that even within a teaching hospital, supply issues affect prescribing behaviour. Aligning the hospital formulary with the National List of Essential Medicines and ensuring uninterrupted supply would address this barrier [23].

Counselling of patients on generics was reported by 67.5% of HCPs and was highest among pharmacists (90.0%) and lowest among nurses (46.7%). The pharmacist is the last professional to see the patient before the medicine is taken and is therefore well placed to explain, reassure and ensure that the patient does not stop treatment when the product looks different from the previous one [30].

The comparison between the two groups shows a perception gap. HCPs were significantly more likely than patients to accept that generics are as effective and as safe as brands, and they had better knowledge. This is encouraging because the prescriber is the pivotal influence on patient acceptance, but it also demonstrates that the confidence of HCPs is not being transmitted to patients, with only about a quarter of patients having asked and a third being counselled on

the topic. Bridging this gap through effective communication is the most feasible short-term intervention. Studies in other settings have likewise emphasised the importance of provider communication and trust in shaping patient acceptance [8,13].

Based on these findings, several measures can be suggested. First, patient education through posters, leaflets and short counselling messages in local languages should explain that generics contain the same active ingredient, are subject to the same quality standards and are not inferior because they are cheaper. Second, continuing medical education for doctors, nurses and pharmacists should address bioequivalence, the difference between true and branded generics, and the regulatory framework. Third, the hospital pharmacy and therapeutics committee should maintain a formulary of quality-assured generics, ensure continuous stock, and consider displaying quality test reports. Fourth, an audit of prescriptions for generic names, with feedback to prescribers, can strengthen compliance with the generic prescribing directive. Finally, wider publicity for Jan Aushadhi outlets, including those within or near hospital premises, would help patients access affordable medicines [1,22].

Strengths and Limitations

The strengths of this study are the simultaneous assessment of patients and different categories of HCPs in the same institution, the use of validated and pre-tested questionnaires, and the adequate sample size for each group. The limitations are that it was a single-centre study with convenience sampling, so the results cannot be generalised to other settings. Self-reported practices may be affected by social desirability bias, particularly among HCPs, and the cross-sectional design permits identification of associations but not of causal relationships. Prescribing practices were not verified against actual prescriptions. Multi-centre studies with random sampling and prescription audits would give more robust evidence.

CONCLUSION

Patients attending this tertiary care teaching hospital had limited knowledge of generic medicines and held mixed attitudes, with a widespread belief that lower price implies lower quality. Healthcare professionals had better knowledge and more favourable attitudes, but

knowledge was uneven across professions, nurses in particular had a low level of knowledge, and prescribing and counselling practices did not fully reflect their stated beliefs. Doubts about quality, non-availability of generics in the hospital pharmacy and the influence of habit and promotion were the main barriers. Targeted patient education, regular training of all categories of HCPs, assured quality and availability of generic medicines, and strengthened implementation of generic prescribing can help the health system to realise the economic and access benefits of generic medicines.

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REFERENCES

1. World Health Organization. Equitable access to essential medicines: a framework for collective action. WHO Policy Perspectives on Medicines, No. 8. Geneva: World Health Organization; 2004.
2. Hassali MA, Shafie AA, Jamshed S, Ibrahim MIM, Awaisu A. Consumers' views on generic medicines: a review of the literature. *Int J Pharm Pract.* 2009;17(2):79-88.
3. Cameron A, Ewen M, Ross-Degnan D, Ball D, Laing R. Medicine prices, availability, and affordability in 36 developing and middle-income countries: a secondary analysis. *Lancet.* 2009;373(9659):240-9.
4. Dunne S, Shannon B, Dunne C, Cullen W. A review of the differences and similarities between generic drugs and their originator counterparts, including economic benefits associated with usage of generic medicines, using Ireland as a typical example. *BMC Pharmacol Toxicol.* 2013;14:1.
5. Ministry of Health and Family Welfare, Government of India. New Drugs and Clinical Trials Rules, 2019. The Gazette of India, Part II, Section 3, Sub-section

- (i). New Delhi: Government of India; 2019.
6. Kesselheim AS, Misono AS, Lee JL, Stedman MR, Brookhart MA, Choudhry NK, et al. Clinical equivalence of generic and brand-name drugs used in cardiovascular disease: a systematic review and meta-analysis. *JAMA*. 2008;300(21):2514-26.
7. Dunne SS, Dunne CP. What do people really think of generic medicines? A systematic review and critical appraisal of literature on stakeholder perceptions of generic drugs. *BMC Med*. 2015;13:173.
8. Colgan S, Faasse K, Martin LR, Stephens MH, Grey A, Petrie KJ. Perceptions of generic medication in the general population, doctors and pharmacists: a systematic review. *BMJ Open*. 2015;5(12):e008915.
9. Shrank WH, Cox ER, Fischer MA, Mehta J, Choudhry NK. Patients' perceptions of generic medications. *Health Aff (Millwood)*. 2009;28(2):546-56.
10. Himmel W, Simmenroth-Nayda A, Niebling W, Ledig T, Jansen RD, Kochen MM, et al. What do primary care patients think about generic drugs? *Int J Clin Pharmacol Ther*. 2005;43(10):472-9.
11. Chua GN, Hassali MA, Shafie AA, Awaisu A. A survey exploring knowledge and perceptions of general practitioners towards the use of generic medicines in the northern state of Malaysia. *Health Policy*. 2010;95(2-3):229-35.
12. Al-Gedadi NA, Hassali MA, Shafie AA. A pilot survey on perceptions and knowledge of generic medicines among consumers in Penang, Malaysia. *Pharm Pract (Granada)*. 2008;6(2):93-7.
13. Howard JN, Harris I, Frank G, Kiptanui Z, Qian J, Hansen R. Influencers of generic drug utilization: a systematic review. *Res Social Adm Pharm*. 2018;14(7):619-27.
14. Shrank WH, Hoang T, Ettner SL, Glassman PA, Nair K, DeLapp D, et al. The implications of choice: prescribing generic or preferred pharmaceuticals improves medication adherence for chronic conditions. *Arch Intern Med*. 2006;166(3):332-7.
15. Selvaraj S, Farooqui HH, Karan A. Quantifying the financial burden of households' out-of-pocket payments on medicines in India: a repeated cross-sectional analysis of National Sample Survey data, 1994-2014. *BMJ Open*. 2018;8(5):e018020.
16. Kotwani A, Ewen M, Dey D, Iyer S, Lakshmi PK, Patel A, et al. Prices & availability of common medicines at six sites in India using a standard methodology. *Indian J Med Res*. 2007;125(5):645-54.
17. Kotwani A. Where are we now: assessing the price, availability and affordability of essential medicines in Delhi as India plans free medicine for all. *BMC Health Serv Res*. 2013;13:285.
18. Prinja S, Bahuguna P, Tripathy JP, Kumar R. Availability of medicines in public sector health facilities of two North Indian States. *BMC Pharmacol Toxicol*. 2015;16:43.
19. Rataboli PV, Garg A. Confusing brand names: nightmare of medical profession. *J Postgrad Med*. 2005;51(1):13-6.
20. Singal GL, Nanda A, Kotwani A. A comparative evaluation of price and quality of some branded versus branded-generic medicines of the same manufacturer in India. *Indian J Pharmacol*. 2011;43(2):131-6.
21. Medical Council of India. Indian Medical Council (Professional Conduct, Etiquette and Ethics) (Amendment) Regulations, 2016. The Gazette of India. New Delhi: Medical Council of India; 2016.
22. Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers, Government of India. Pradhan Mantri Bhartiya Janaushadhi Pariyojana (Jan Aushadhi Scheme). New Delhi: Bureau of Pharma Public Sector Undertakings of India; 2008-2021.
23. Ministry of Health and Family Welfare, Government of India. National List of Essential Medicines 2015. New Delhi: Ministry of Health and Family Welfare; 2015.
24. Hassali MA, Alrasheedy AA, McLachlan A, Nguyen TA, Al-Tamimi SK, Ibrahim MIM, et al. The experiences of implementing generic medicine policy in eight countries: a review and recommendations for a successful promotion of generic medicine use. *Saudi Pharm J*. 2014;22(6):491-503.
25. Kaplan WA, Ritz LS, Vitello M, Wirtz VJ. Policies to promote use of generic medicines in low and middle income countries: a review of published

- literature, 2000-2010. Health Policy. 2012;106(3):211-24.
26. Lwanga SK, Lemeshow S. Sample size determination in health studies: a practical manual. Geneva: World Health Organization; 1991.
 27. World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. JAMA. 2013;310(20):2191-4.
 28. Indian Council of Medical Research. National Ethical Guidelines for Biomedical and Health Research Involving Human Participants. New Delhi: Indian Council of Medical Research; 2017.
 29. Banahan BF 3rd, Kolassa EM. A physician survey on generic drugs and substitution of critical dose medications. Arch Intern Med. 1997;157(18):2080-8.
 30. Kesselheim AS, Bykov K, Avorn J, Tong A, Doherty M, Choudhry NK. Burden of changes in pill appearance for patients receiving generic cardiovascular medications after myocardial infarction: cohort and nested case-control studies. Ann Intern Med. 2014;161(2):96-103.