

# Opinion of primary care physicians regarding prescription of generic drugs: A Cross-sectional study

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## ABSTRACT

**Background:** Generics are low-cost alternatives of the existing approved branded drugs. The aim of this work was to study knowledge and perception about generic drugs among the doctors practicing in government and private healthcare sectors. **Methods:** A cross-sectional study was conducted with a prevalidated questionnaire. Physicians working in government and private healthcare sectors were asked to fill the survey form after obtaining written informed consent. Descriptive analysis was used. **Results:** Of 240, 11.6% of primary care physicians could identify all the correct statements regarding generic drugs and 57% physicians agreed or strongly agreed that doctors should prescribe only generic drugs. Substandard quality (24.4%) and less effectiveness (35.6%) of generics was cited major reason for low use. Majority (76.1%) believed that patients will accept substitution of branded with generics but 21% either did not or rarely inform patients regarding generics. Only 11.7% considered generics has low efficacy as compared to branded drugs but majority (57.4%) denied the interchangeability of generics. Majority were aware about the Jan Aushadhi scheme (79.3%) and Indian Medical Council Act (Professional conduct, Etiquette and Ethics) (76.8%). For personal use, 45.6% preferred generics. Around 44% agreed/strongly agreed for pharmacist's right to substitute branded drugs with generics but private practicing physicians opted against it. **Conclusion:** Knowledge and acceptance of generic drugs is still low amongst the doctors. Efforts need to be done increase the awareness and acceptability.

**Keywords:** Doctors, generic drugs, healthcare, perception, primary care physicians

## Introduction

India is one of the fastest-growing economies of the world and for sustained economic development proper health of population is of prime importance. At present times, with the rise in population, the number of diseases has also increased and with that the increasing cost of the treatment lends a huge economic burden on the society.<sup>[1]</sup> Since 1970, access to essential

medicines has been a crucial public health agenda for the World Health Organization (WHO) for sustaining an effective primary health care.<sup>[2]</sup> With the rapid rise in burden of chronic non-communicable diseases (NCDs) in low- and middle-income countries it is crucial to have an improved access to the medicines at an affordable or bare minimum price for the society.<sup>[3]</sup> The healthcare system in India is diversified and consists of government setups at primary, secondary and tertiary levels, private institutions and healthcare facilities provided by private practitioners. The total budgetary allocation for healthcare sector has improved from earlier but was only 3.53% by 2017 as per the World Bank data which is quite limited for a huge

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population our country contains.<sup>[4]</sup> The coverage of medical or health insurance in India is merely 15% hence out-of-pocket expenditure for health care is a common phenomenon in India.<sup>[5]</sup> In view of such scenario, the healthcare expenditure of majority of the population incurs a huge economic burden and hence access to low -cost essential medicines with same quality and efficacy called generics is need of the hour. The Food and Drug Administration (FDA) defines generic drug as “a medication created to be the same as an existing approved brand-name drug in dosage form, safety, strength, route of administration, quality, and performance characteristics”.<sup>[6]</sup> Basically, generics are medicines that exhibits an equivalent therapeutic effect and safety and are interchangeable to branded medicines or innovator product at a very cheaper price as compared to the innovator product. Generics are approximately 20% to 80% cheaper than the innovator product and their proper usage by the prescribers can bring down the healthcare cost to a great extent.<sup>[7,8]</sup> There are few common misconceptions as identified by Food and Drug Administration (FDA) about generic medications like less effective, delayed benefit, unsafe and are substandard in nature.<sup>[8]</sup> Hence a proper knowledge and attitude towards generics is essential for enhancing its usage without compromising its quality. The Government of India (GoI), in 2015 started a programme named “Pradhan Mantri Bhartiya Janaushadhi Pariyojana” with an aim to make the quality unbranded medicines affordable and available for citizens of India and particularly for the poor and disadvantaged section of the society.<sup>[9]</sup> To run this scheme smoothly GoI has opened exclusive retails stores named as “Pradhan Mantri Bhartiya Janaushadhi Kendras” which are pharmacies selling mainly generic medicines in a very nominal price.<sup>[10]</sup> Evidence shows the average price of generic medicines were 64%–91% lower than that of the innovator or branded drug.<sup>[11]</sup> The Medical Council of India, recently has made it mandatory for prescribers to prescribe by generic names instead of brand names as far as possible and write and prescription legibly and preferably in capital letters.<sup>[12]</sup> In spite of multiple steps taken by GoI to promote generics the perception and usage of generics has been unsatisfactory. The perception and prescribing behavior of primary care physicians play a crucial role in enhancing the utilization of generics.<sup>[13]</sup> As patients have a limited role in selection of medicines and it is almost entirely controlled by the primary care physicians whether to select generics or brand medicines for patients. Literature also reveals that physicians perceptions towards generics can have a crucial impact on patients’ perception, acceptance and use of generics.<sup>[13-16]</sup> The generic use and substitution is common practice in the western countries still the knowledge and perception of the primary care physicians towards the generics in the studies in abroad are not up to the mark.<sup>[17-23]</sup> There are few studies conducted in India which reports positive results with a good knowledge and attitude among the physicians which is an optimistic sign for the healthcare system.<sup>[24-26]</sup> Contrarily, literature search also shows a few studies conducted in India with inadequate knowledge and perception of the doctors towards the generics.<sup>[27-30]</sup> As there was inconsistency with the evidence, this study

was planned to assess knowledge and perception of generic drugs among doctors. Objective was to study knowledge and perception about generic drugs among the practicing primary care physicians and highlight the factors influencing practice of prescription of generics.

## Methodology

This is a cross-sectional study conducted on the primary care physicians in Patan city of Gujarat. A list of all practicing primary care physicians was obtained from the local professional body of the Indian Medical Association (IMA) after explaining the study objectives to contact all the primary care physicians working in Patan city. After obtaining formal permission from local IMA, first the physicians registered with IMA were interviewed and followed by other physicians in the city were interviewed based on snowball sampling technique. The tool was developed for quantitative data collection based on the previous work and comments of the experts and was pilot tested. The tools were revisited and were modified based on the observations from piloting and after finalization tools were administered to the patients attending the OPD and Hospitals of the selected primary care physicians. The data was collected in the pretested tools and entered in the Microsoft Excel and analyzed using Statistical Package for the Social Sciences version 21. A descriptive and inferential analysis was done. The study was approved from institutional ethics committee and informed consent was taken before enrollment of the participants.

## Results

### Sociodemographic profile

A total of 240 primary care physicians both (government & private practitioners) practicing in the city of Patan were interviewed and mean age of physicians who participated in the study was 36.82 (SD = 12.29). On average, female physicians [mean age = 30.66 (SD = 7.89)] were younger than males where the mean age was 40.14 (SD = 12.96). Majority (41.3%) had their private clinic and were not associated with any government hospital or trust hospitals. Of 240 physicians, 65% were male. Allopathic doctors constituted about 80% and the remaining 20% were Ayurveda or Homeopathic doctors. About 85% were younger than 50 years and approximately half of the physicians had practice experience below 10 years [Table 1].

### Knowledge of primary care physicians regarding generics

About 32% of the primary care physicians defined generic drugs as the drugs which are prescribed by their actual name, 20% defined as drugs having the same content and equal efficacy to brand, 31.6% defined as low-cost alternative to branded drugs and only 11.6% could identify all the correct sentences about the generic drugs [Table 2a].

**Table 1: Socio demographical characteristics of the primary care physicians**

Parameters	Frequency (%)
Place of Work	
Primary Health Centre	24 (10)
Community Health Centre	14 (5.8)
District Hospital	6 (2.5)
Tertiary Health Centre	69 (28.8)
Private Practice	99 (41.3)
NGO/Trust	10 (4.2)
Others	18 (7.5)
Gender	
Male	156 (65)
Female	84 (35)
Educational Qualification	
MD	29 (12.1)
MBBS	160 (66.7)
BAMS	5 (2.1)
BHMS	11 (4.6)
Others	35 (14.6)
Age (Years)	
<30	97 (40.4)
30-60	108 (45)
>60	35 (14.6)
Experience in years (n=195)	
<10	107 (54.9)
10-30	74 (37.9)
>30	14 (7.2)

n=Number of physicians, Values in parenthesis are percentages

Majority (86.5%) of them were aware of the Medical Council of India's advisory about the prescription of generic drugs. Majority (57.4%) of them disagreed that generics are usually interchangeable with innovator drugs. Only 26.4% agreed that generics can only be marketed after the expiry of patent of innovator drug. Majority (67.6%) knew that generics has same active substance in same dose to be used for the same disease. Only 26.6% reported that generics do not need to repeat preclinical and clinical studies, whereas majority (53.4%) correctly reported that generics need to conduct bioequivalence studies to demonstrate equivalence with the innovator medicine. Majority were aware about the Jan Aushadhi scheme of GoI (79.3%) and Indian Medical Council Act (Professional conduct, Etiquette and Ethics) regulations (76.8%) [Table 2b].

### Perception of the primary care physicians regarding generics

About 57% physicians agreed or strongly agreed that doctors should prescribe only generic drugs and the reasons provided was low cost of the generic drugs. For rest of the physicians who disagreed with prescribing only generic drugs, the main reason quoted was substandard quality (24.4%) and less effectiveness of generics (35.6%) [Table 3a].

Around 44% physicians agreed/strongly agreed that pharmacist should be given permission to substitute branded drugs with generics and among who agreed/strongly agreed reported

**Table 2a: Knowledge of Generics survey questionnaire**

Questions	Frequency (Percentages)
Definition of Generic Drugs (n=206)	
Drugs prescribed with actual name of drug	67 (32.5)
Drugs with equal efficacy/same content	45 (21.8)
Less costly version of brand	65 (31.6)
Copy of brand	5 (2.4)
Drugs require less research	1 (0.5)
Bioequivalent to brand	10 (4.9)
Substandard drugs/Inferior quality drugs	4 (2)
Drugs prescribed with chemical name	3 (1.5)
Generics are (n=232)	
Bioequivalent to branded medicines	16 (6.9)
A less expensive version of branded medicines	20 (8.6)
Of equivalent quality and efficacy of as of branded medicines	28 (12.1)
Less costly than the brand medicine	48 (20.7)
Others	4 (1.7)
1 & 2	3 (1.3)
2 & 4	21 (9.1)
1 & 4	16 (6.9)
1 & 3	4 (1.7)
3 & 4	19 (8.2)
2 & 3	2 (0.9)
1 & 2 & 4	8 (3.4)
1 & 3 & 4	8 (3.4)
2 & 3 & 4	5 (2.2)
1 & 2 & 3	1 (0.4)
1 & 2 & 3 & 4	27 (11.6)
1 & 2 & 3 & 4 & 5	2 (0.9)

n=Number of physicians

that patients will get cheap drugs (48.4%) as the main reason [Table 3b].

Majority (76.1%) believed that patients will accept substitution of branded with generics. About 61% considered generics are equally effective as brands and about 47% considered safety of generics to be high or very high. Majority considered cost of the generics is low (72.4%) and generics are an important tool for overall health expenditure (87.8%). [Table 3c].

### Practice of primary care physicians regarding generics

Only about 21% physicians either did not or rarely inform patients about the generics. For personal use, 45.6% preferred generics, 48.1% preferred branded and 6.3% stated that they use both but depending on the clinical condition. Around 46.2% strongly agree/agreed for the fact that they take generic drug for any disease [Table 4].

The primary care physicians stated that they get information about the generics from multiple sources like medical journal, conferences and most commonly from the medical representatives (12.6%). A logistic regression analysis to evaluate the effect of various factors on the opinion that doctors to

**Table 2b: Knowledge of generics survey questionnaire**

Questions	Response	Frequency (Percentages)
Do you know MCI advisory regarding prescription of generic drugs in India? (n=237)	Yes	205 (86.5)
	No	32 (13.5)
Generic drug are usually intended to be interchangeable with an innovator drug. (n=237)	Yes	54 (22.8)
	No	136 (57.4)
	Don't know	47 (19.8)
Generic drug can only be marketed after the expiry date of the patent of innovator. (n=235)	Yes	62 (26.4)
	No	81 (34.5)
	Don't know	92 (39.1)
Generic drug contains the same active substance (s) as the innovator medicine, and it is used at the same dose (s) to treat the same disease (s) as the innovator medicine. (n=238)	Yes	161 (67.6)
	No	20 (8.4)
	Don't know	57 (23.9)
Generic drug manufacturer need to repeat the preclinical and clinical studies required for originator medicine. (n=237)	Yes	88 (37.1)
	No	63 (26.6)
	Don't know	86 (36.3)
Generic drug manufacturer need to conduct bioequivalence studies to demonstrate equivalence between the generic medicine and the innovator medicine. (n=236)	Yes	126 (53.4)
	No	37 (15.7)
	Don't know	73 (30.9)
Indian Medical Council Act (Professional conduct, Etiquette and Ethics) regulations, 2002 states that every physician should, as far as possible, prescribe generic drugs. Are you aware about it? (n=237)	Yes	182 (76.8)
	No	11 (4.6)
	Don't know	44 (18.6)
Are you aware of regarding the scheme of Government of India called Jan Aushadhi whose purpose is to set up generic drug stores around the country? (n=237)	Yes	188 (79.3)
	No	23 (9.7)
	Don't know	26 (11)

n=Number of physicians

**Table 3a: Perception questionnaire regarding generics**

Questions	Response	Frequency (Percentages)
Do you think doctors should prescribe generic drugs only	Strongly Agree	43 (17.9)
	Agree	94 (39.2)
	Neutral	55 (22.9)
	Disagree	36 (15)
	Strongly Disagree	12 (5)
If strongly agree/agree mention the reasons (n=117)	Low cost	88 (75.2)
	If patient demands	3 (2.6)
	As efficacious as brand	17 (14.5)
	Easy to remember	2 (1.7)
	Easily available	1 (0.9)
	Bioequivalent with brand	2 (1.7)
If Strongly disagree/disagree mention the reasons (n=45)	Safe	4 (3.4)
	No bioequivalence with brand	4 (8.9)
	Substandard	11 (24.4)
	Non availability	2 (4.4)
	Less effective	16 (35.6)
	Not safe	1 (2.2)
	Patient do not want	2 (4)
Others	9 (20)	

n=Number of physicians

prescribe only generic drugs showed that of various factors like gender, educational qualification, age, experience and place of work, only working at the Community Health Centre (CHC) was found to be associated with it (OR = 10.45,  $P = 0.048$ ) [Table 5]. Similar logistic regression was used to assess various factors which may affect the physician's opinion that pharmacist should have right to substitute branded drugs with generic drugs. Of all the

factors, physician with private practice had a negative opinion and rest of the factors were not found to affect the opinion of doctors (OR = 0.27,  $P = 0.03$ ) [Table 6].

## Discussion

This study tries to assess perception, behavior and opinion of primary care physicians towards generic medications in their clinical practice. Majority were private practitioner and practiced allopathy. In this study, around one-third of the physicians defined the generic drugs are the drugs which are prescribed by their actual name; however, around 20% defined the generic drugs as drugs having same content and equal efficacy to brand. It was observed that only 11.6% physicians could identify all the correct statements regarding generic drugs that warrants an urgent intervention not only at community level but also at physician's level. The study results were similar to study conducted by Mahdi *et al.* and Fadare *et al.*<sup>[20,22]</sup> Around 57% physicians agreed or strongly agreed that doctors should prescribe only generic drugs and the most common reason cited was low cost of the generic drugs. For those who disagreed gave the reason of substandard quality (24.4%) and less effectiveness (35.6%) of generic drugs as compared to brand. Study finding was almost similar to the study done by Fadare *et al.* (21.5%) but low quality of generics were also reported by other several studies conducted by Bhattacharjee P *et al.* (32.5%), Gebresillassie *et al.* (36.6%), Čatić *et al.* (37%) Singh *et al.* (38%) and Mahadi *et al.* (57.3%).<sup>[17,20,22,24,27,31]</sup>

Majority (76.1%) of doctors believed that patients would accept generic substitutions in place of brand drug. Prasad *et al.* reported

**Table 3b: Perception questionnaire regarding generics**

Questions	Response	Frequency (Percentages)
Do you think Pharmacist should have permission to substitute brand by generics? (n=239)	Strongly agree	26 (10.9)
	Agree	79 (33.1)
	Neutral	66 (27.6)
	Disagree	49 (20.5)
	Strongly disagree	19 (7.9)
If strongly agree/agree mention the reasons (n=91)	Patients will get cheap drugs	44 (48.4)
	As generics has same effect as brand	14 (15.4)
	It will promote use of generic drugs	2 (2.2)
	Only if patient demands	6 (6.6)
	Easily available	13 (14.3)
	Only if pharmacist knowledgeable	7 (7.7)
	Others	5 (5.5)
If Strongly disagree/disagree mention the reasons (n=55)	No bioequivalence with generics	1 (1.8)
	Pharmacists less knowledgeable	18 (32.7)
	Pharmacist may dispense substandard drug	4 (7.3)
	Pharmacist may dispense irrational combination	1 (1.8)
	Pharmacist may prescribe overpriced drug	11 (20)
	Pharmacist has no legal right to substitute	11 (20)
	Pharmacist may dispense less efficacious drug	6 (10.9)
	Many pharmacy stores run by unqualified people	1 (1.8)
	Others	2 (3.6)

n=Number of physicians

**Table 3c: Perception questionnaire regarding generics**

Questions	Response	Frequency (%)
Do you think patients will be ready to accept generic substitutions in place of brand drug? (n=238)	Yes	181 (76.1)
	No	57 (23.9)
I believe that generic medicines are as effective as brand. (n=238)	Disagree strongly	27 (11.3)
	Disagree somewhat	30 (12.6)
	Neither agree not disagree	36 (15.1)
	Agree somewhat	95 (39.9)
	Agree strongly	50 (21)
	Generic drugs are an important tool for overall health expenditure. (n=237)	Yes
I am concerned about the quality of generic drugs. (n=238)	No	10 (4.2)
	Don't know	19 (8)
	Disagree strongly	26 (10.9)
	Disagree somewhat	42 (17.6)
	Neither agree not disagree	48 (20.2)
What is your opinion regarding efficacy of generic drugs? (n=231)	Agree somewhat	60 (25.2)
	Agree strongly	62 (26.1)
	Very High	18 (7.8)
	High	85 (36.8)
	Moderate	101 (43.7)
What is your opinion regarding safety of generic drugs? (n=235)	Low	27 (11.7)
	Very High	19 (8.1)
	High	91 (38.7)
	Moderate	100 (42.6)
	Low	25 (10.6)
What is your opinion regarding cost of generic drugs? (n=232)	Very High	10 (4.3)
	High	12 (5.2)
	Moderate	42 (18.1)
	Low	168 (72.4)

n=Number of physicians

that about 61% doctors permitted the patients to substitute generic for a brand or vice-versa and study by Čatić *et al.* reported that 49.0% patients disapproved the generic substitution.<sup>[29,31]</sup>

This study reported about 61% physicians strongly agreed or agreed that generics are equally effective as brand. The study results were at par with the studies reported by Singh *et al.* (56%),

**Table 4: Practice questionnaire regarding generics**

Questions	Responses	Frequency (%)
How often you inform patients about availability of generic drugs for the brand name prescribed by you. (n=238)	Never	24 (10.1)
	Rarely	26 (10.9)
	Sometimes	83 (34.9)
	Often	88 (37)
	Always	17 (7.1)
When buying drugs for yourself you typically choose (n=239)	Generic	109 (45.6)
	Brand	115 (48.1)
	Either of two depend on clinical condition	15 (6.3)
When advising my family, I recommend they use generics first. (n=238)	Disagree strongly	39 (16.4)
	Disagree somewhat	33 (13.9)
	Neither agree not disagree	46 (19.3)
	Agree somewhat	78 (32.8)
	Agree strongly	42 (17.6)
	I myself take generic drug for any disease. (n=238)	Disagree strongly
Disagree somewhat		41 (17.2)
Neither agree not disagree		43 (18.1)
Agree somewhat		61 (25.6)
Agree strongly		49 (20.6)

n=Number of physicians

**Table 5: Factors affecting the opinion of the primary care physicians that physicians should prescribe only generic drugs**

Parameters	OR	95% CI	P
Place of Work			
Primary Health Centre			
Community Health Centre	10.45	1.02-106.5	0.048*
District Hospital	0.75	0.10-5.43	0.778
Tertiary Health Centre	1.29	0.39-4.23	0.675
Private Practice	0.40	0.12-1.29	0.126
NGO/Trust	1.63	0.28-9.21	0.582
Others	2.18	0.49-9.73	0.307
Gender			
Male			
Female	1.36	0.64-2.90	0.420
Educational Qualification			
MD			
MBBS	0.99	0.40-2.46	0.993
BAMS	0.96	0.12-7.41	0.778
BHMS	1.37	0.27-7.00	0.703
Others	0.31	0.09-1.01	0.054
Age (Years)			
<30	1		
30-60	2.23	0.91-5.46	0.079
>60	2.35	0.56-9.83	0.240
Experience in years (n=195)			
<10			
10-30	0.741	0.31-1.75	
>30	0.609	0.11-3.28	0.564

\*P&lt;0.05, significant

Bhattacharjee P *et al.* (72.5%) and Gupta SK *et al.* (78.1%).<sup>[24,25,27]</sup> There were also few studies reported by Tandel *et al.* (42.6%), Ćatić *et al.* (45.4%), Flood *et al.* (50%), and Gyawali *et al.* (50.3%) where the reported findings were low as compared to our study.<sup>[18,21,28,31]</sup> A large number (72.4%) of physicians considered generics are

of low cost and findings were similar with Tandel *et al.* (75%).<sup>[28]</sup> This study reported that 44% of the physicians believed that pharmacist should be given permission to substitute branded drugs by generics that clearly narrates the power dynamics within various stakeholders. Several studies conducted by Bhattacharjee P *et al.* (17.5%), Fadare *et al.* (17.8%), El-Dahiyat *et al.* (61%) and Gebresillassie *et al.* (75.2%) have reported mixed results regarding the opinion of allowing pharmacists to allow substitution by generics.<sup>[17,22,24,32]</sup> A few number (10%) of physicians believed that generics are not safe and similar results were reported by studies conducted by Tandel *et al.* (8.8%), Fadare *et al.* (15.2%), Bhattacharjee P *et al.* (17.5%) and Singh *et al.* (18.5%).<sup>[22,24,27,28]</sup> There were few studies conducted by Gupta SK *et al.* (24.7%), Desai *et al.* (28.1%), Mahdi LA *et al.* (34.7%), Gebresillassie *et al.* (35.6%) and Flood *et al.* (55%) which reported higher proportion of physicians who believed that generics aren't safe.<sup>[17,18,20,25,26]</sup> The perception of substandard quality, less effectiveness and unsafe nature of generics can be eliminated by conducting regular sensitization sessions and continued medical education for the physicians regarding drug discovery, development, and regulations governing generics which might help in increased prescribing of generics by the physicians.<sup>[33]</sup> In a study conducted by Tian Y *et al.* comparing effectiveness of antihypertensive, lipid-lowering and hypoglycemic generic medicines with their branded drugs concluded that generics were found to be similar and even superior in few cases as compared to their branded alternatives while monitoring mortality and major cardiovascular events.<sup>[34]</sup>

About a quarter (22.8%) of physicians believed generics are interchangeable with branded drug. The proportion reported by this study was low as compared to other several studies conducted in India by Gupta R *et al.* (62.9%), Gupta SK *et al.* (63.0%) and Bhattacharjee P *et al.* (67.5%).<sup>[24,25,35]</sup> The findings from the studies conducted abroad by Fadare *et al.* (47.1%), Mahdi LA

**Table 6: Factors affecting the opinion of the primary care physicians that the pharmacists should have right to substitute brand with generics**

Parameters	OR	95% CI of OR	P
Place of Work			
Primary Health Centre			
Community Health Centre	2.44	0.47-12.70	0.289
District Hospital	1.66	0.20-13.34	0.634
Tertiary Health Centre	0.83	0.26-2.68	0.759
Private Practice	0.27	0.08-0.88	0.030*
NGO/Trust	0.69	0.13-3.54	0.655
Others	0.85	0.20-3.52	0.962
Gender			
Male			
Female	0.98	0.47-2.03	0.962
Educational Qualification			
MD			
MBBS	0.55	0.21-1.40	0.211
BAMS	0.91	0.10-8.09	0.935
BHMS	1.03	0.20-5.16	0.968
Others	0.70	0.23-2.18	0.546
Age (Years)			
<30			
30-60	2.07	0.87-4.94	0.102
>60	0.742	0.16-3.41	0.701
Experience in years (n=195)			
<10			
10-30	0.73	0.31-1.70	0.466
>30	0.84	0.12-5.80	0.858

\*P&lt;0.05, significant

*et al.* (69.4%), Tandel *et al.* (76.5%) and Čatić *et al.* (84%) were also higher as compared to this study.<sup>[20,22,28,31]</sup>

A quarter (26.4%) of physicians in this study believed that generic drug can be marketed after the expiry of the patent of innovator molecule. The finding reported by Tandel *et al.* (13.2%) and Bhattacharjee P *et al.* (20%) were lower than this study but other studies conducted by Mahdi LA *et al.* (36.3%), Fadare *et al.* (38.7%), Gupta R *et al.* (56.2%) and Gupta SK *et al.* (57.5%) reported higher proportion as compared to this study.<sup>[20,22,24,25,28,35]</sup> Majority (67.6%) of physicians believed that generics contain same active substance(s) and at the same dose(s) as that of the innovator medicine and study findings were supported by as reported by Tandel *et al.* (61.8%) and Fadare *et al.* (64.9%).<sup>[22,28]</sup> Studies conducted by Gupta S K *et al.* (76.7%), Gupta R *et al.* (89.9%) and Bhattacharjee P *et al.* (92.5%) reported higher proportion as compared to this study.<sup>[24,25,25]</sup> About 37.1% of the physicians in this study believed that generics manufacturer need to repeat the preclinical and clinical studies. Several other studies conducted by Gupta S K *et al.* (54.8%), Gupta *et al.* (58.4%), Bhattacharjee P *et al.* (65%), Tandel *et al.* (67.6%) and Čatić *et al.* (75%) reported higher proportion of physicians as compared to this study.<sup>[24,25,28,31,35]</sup> A significant proportion (87.8%) of physicians believed that generics are an important tool for overall health expenditure and the findings were similar with few studies conducted by Desai

*et al.* (77.2%), Gupta *et al.* (88.8%), Bhattacharjee P *et al.* (95%), Gupta S K *et al.* (90.4%) and El-Dahiyat *et al.* (92%) but study done by Gebresillassie *et al.* (37.4%) reported lower value as compared to this study.<sup>[17,24-26,32,35]</sup> Approximately half (53.4%) of the physicians in this study believed that generics manufacturer need to conduct bioequivalence studies. Studies conducted by Gupta R *et al.* (77.5%), Bhattacharjee P *et al.* (95%), Gupta SK *et al.* (79.5%), Tandel *et al.* (72%) and Singh *et al.* (79.5%) reported higher values than this study.<sup>[24,25,27,28,35]</sup>

About 76.8% of the physicians reported that they were aware of the Indian Medical Council Act (Professional conduct, Etiquette and Ethics) regulations. The study results were almost comparable to the studies conducted by Gupta R *et al.* (80.9%), Bhattacharjee P *et al.* (90%), and Gupta SK *et al.* (79.5%) but Tandel *et al.* (29.4%) reported a lower awareness.<sup>[24,25,28,35]</sup> Nearly 79.3% of the physicians were aware of the called Jan Aushadhi scheme of Government of India and the awareness reported by other studies conducted by Tandel *et al.* (79.4%), Gupta *et al.* (67.4%) and Bhattacharjee P *et al.* (100%) were good enough but few like Gupta SK *et al.* (45.2%) and Desai *et al.* (59.6%) reported a lower awareness.<sup>[24-26,28,35]</sup> A few number (12.6%) of physicians reported that they get the information about the new drugs from the medical representatives. Singh *et al.* in their study reported that medical representatives and drug company leaflets were the most common sources of drug information. Studies conducted by Salhia *et al.* (45.5%), Fadare *et al.* (44.5%) and Abduelkarem *et al.* (64%) reported higher proportion of physicians getting informed by medical representatives.<sup>[19,22,36]</sup>

It is quite customary that the decision of prescription is being taken by primary care physicians and patients have a very minimal role in it hence the perception regarding generics in the primary care physicians needs to be improved in order to improve the use of generics.<sup>[13-16,36]</sup> Apart from the push from the government for increasing use of generics, pharmaceutical industry should also pitch in to improve the perception and use of generics in the society.<sup>[37]</sup>

This study was an effort to bring forward the opinion of practicing primary care physicians regarding generic medications which are a cost-effective alternative of the branded ones. The findings of the study would help the primary care physicians and authorities like IMA to evaluate and retrospectively analyze the shortcomings and plan accordingly to improve the perception of generics among the physicians which would in turn increase the prescription of generics and reduce the healthcare cost for the patients and society.

## Conclusion

The knowledge and acceptance of generic drugs is still unsatisfactory amongst the primary care physicians. Efforts need to be done to increase the awareness and acceptability among the primary care physicians and stress should be laid upon better physician-patient communication regarding the

generics which can help improve the acceptability and use of generics in public.

## Recommendations

The prescription of generics by the primary care physicians can be improved by beginning sensitization of the doctors right from their medical curriculum days and stress on the practice during their internship. Regular conferences, seminars, awareness programs and training sessions to sensitize the practicing doctors. Assuring availability of generics in government and private hospital pharmacies. Improvement in quality, safety and efficacy of generics by vigorous quality testing and following good manufacturing practices. Patients should be educated regarding the generics and given freedom to choose between generic and branded drugs.

## Key points from the study

- Based on the observations it is important to engage the primary care physicians and pharmacist as they appear to be the strongest link in advocating the generics
- Efforts should be made to engage with the community and popularize the generics as they seem to be the weakest link in the acceptance of generics.

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## Conflicts of interest

There are no conflicts of interest.

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