



Influence of Medical Practitioners' Practice on the Prescription Behavior for Generic Medicines

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Abstract

Purpose: The study is an endeavor to evaluate influence of practice on doctors' behavior towards generic medicines limiting its mass use. Practice, one factor amongst several, was chosen to evaluate doctors' behavior towards generic medicines. Rising healthcare cost is drawing serious interest towards generic medicines from majority of the countries, developed or developing. In India, out of pocket expenses towards healthcare costs are one of the highest in the world. Besides, affordability is another major challenge in bearing healthcare cost due to its demographics. The alternative to expensive branded medicines is generics, the much talked about in recent times. Generic medicines are being promoted by the government of several countries, doctors in India are being advised to write prescription in generic names. However, there are several challenges in acceptance and usage of generic medicines.

Study design: A questionnaire constructed descriptive, cross-sectional study was conducted in North India in 2020 amongst 228 doctors at primary, secondary and tertiary healthcare centers.

Findings: Spearman's rank correlation was computed to evaluate the statistical significance between doctors' practice and prescribing of generic medicines which was found to be positively correlated indicating a significant moderate association between the variables. Practice of doctors has an influence towards prescribing generic medicines which explains limited use of generics.

Research limitations: Articles published earlier than 2007 were not considered for review as they might be irrelevant with the present evolving practices. All the articles in all the databases including some of the paid articles may not have been captured in the search limiting review.

Social implications: The study is of national importance that addresses the challenges around the practice of doctors influencing prescription of generic medicines.

Keywords: generic medicines, generic drugs, knowledge, attitude, practice, doctors, consumers, patients, chemists, government policy

Originality: This is an original study conducted by the authors

Introduction

Doctors perform an important role of a protagonist in the treatment of medical illness of patients by prescribing medicines. It is the decision of a doctor to prescribe medicines in brand or generic names. Generic medicines are being promoted in many countries for affordable access to medicines.

The original or an innovator's drug and its generic alternative are alike, meant to do the same thing (FDA, 2018; WHO, 2021) but have huge price difference. Pharmaceutical companies engaged in generic manufacturing are able to sell medicines at substantial low prices as they are not required to repeat costly clinical trials conducted by the originator.

Along with the originator's brand, several branded generics may be available post patent expiry as substitute to each other, however, there is only one generic name for each medication. Augmentin, for instance, is the brand name for the generic medication amoxicillin plus clavulanic acid which is the original research molecule of GSK, however, besides Augmentin there are several other brands known as *branded generics* available in the Indian market with the same medication such as Bactoclav (Micro Labs), Novaclav (Cipla) and others. Also available at Janaushadhi stores (Indian government supported initiative) is a pure generic of amoxicillin plus clavulanic acid (without a brand name). The strength, dosage, intended use, the way the product is taken into the body, effects, side-effects, safety and risks of generics / branded generics are the same as the innovator's product.

Indian pharmaceutical market is dominated by branded generics, medication in generic name sold under different brand names. Mostly, the branded generic medicines are promoted to doctors for their support in getting prescriptions and are priced higher than the generics (without

any brand name) sold through Janaushadhi (generic drug stores). However, some of the branded generic medicines are not promoted to doctors but offered to chemists at huge discounts making it attractive for them to push or substitute as generics. The price advantage on some of the branded generics has also been found attractive in dispensation at in-house pharmacies of privately managed clinics & secondary care hospitals.

The regulatory directive to doctors to prescribe generic drugs has not been able to garner full support of medical practitioners mostly in the private sector. The unwillingness in doctors to prescribe generic drugs needs to be acknowledged to understand the influence of knowledge, attitude and prescription behavior amongst them. The study primarily focusses on understanding the practice of medical practitioners towards generic medicines.

Review of literature

Savings in cost is the prime purpose in making generic medicines popular by the governments of several countries. Savings in the range of 9 to 89% has been recognized by multiple studies in developing countries by way of dispensing generics for a prescription in branded medicine (Cameron et al., 2012).

World Health Organization health expenditures data of 2016 shows 65% out-of-pocket expenses (OOPE) of health expenditure in India in comparison to 20% of world average.

65.07% of India's population lived in the rural areas in 2020 (Index Mundi, 2022) where access to healthcare and affordability has been a challenge.

In a study (Billa et al., 2014), it was found that the factors preventing use of generics in India were due to limited therapeutic index drugs (43.5%) and fear of inferior quality (38.5%). At a college in Central India, a good majority of doctors (98.4%) including junior and senior residents, interns and academicians had good awareness of generic medicines but it did not reflect in prescription of generic medicines (Badwaik et al., 2015). The partial availability, poor awareness and attitude of patients regarding quality of generic drugs hinder its widespread acceptance in prescribing and dispensation (Tripathi & Bhattacharya, 2018).

Customers cited their positive experiences with previously used medicines as the main reason for refusing substitution (Heikkila et al., 2007). A higher number of lay people (34.03%) felt negatively about substitution of branded drugs with generics, compared to 24.11% of doctors and 11.04% of pharmacists (Colgan et al., 2015). In a study conducted to determine the

association between the quality of generic drugs and brand equity of branded drugs and to evaluate a doctors' opinion in determining generic drugs for selected indications in India (Sanyal & Datta, 2011), the results showed that the brand equity is affected by the judged quality of branded drugs through the mediating variables, internal (product information) and external (price, product name, country of origin, retailer reputation, advertising level). The results also showed that doctors' experience with quality of medicines used leads to quality expectations of substitutable products.

In a study conducted in Japan (Hoshi & Kimura, 2008) it was revealed that one of the reasons for non-use of generic medicines by patients is due to prescribing of branded medicines by physicians. The factors influencing doctors in their choice of medicines in Malaysia are marketing promotional activities of pharmaceutical companies such as advertisements and product bonuses, socio-economic status of patients and credibility of manufacturers (Chua et al., 2010). In a study on customer loyalty (Bachheti & Saklani, 2013), it was found that both rewards to doctors and striking of close relationships between doctors & medical representatives influence doctors' prescription. Negative perceptions on quality of generic drugs and doctors' oriented promotional activities by pharmaceutical companies for branded drugs is leading to choosing expensive branded drugs in the private sector (Aivalli et al., 2018). The doctors' prescriptions are mainly driven by the marketing activities of the pharmaceutical companies through the regular visits by the medical representatives (Shetti & Khanna, 2019). It was found that the pharmaceutical industry has heavy dependency on doctors for prescription of medication, the doctors make a choice not the patients. Therefore, influencing doctors by pharmaceutical companies is the key to drug sales. Majority of doctors (62%) acknowledge having been influenced by marketing promotional strategies of pharmaceutical companies (Narayan et al., 2020).

Doctors have come to trust over time leading companies like Cipla, Dr Reddy's Lab, Sun Pharma and others which are popular for branded generics. Medical representatives of pharma companies have performed very well in building the trust. Transfer of trust to unknown companies manufacturing generic medicines is not possible who mostly sell products with a brand name without promotion (Soans, 2022).

Pharmaceutical companies engaged in aggressive promotion of branded generic medicines further augments the problem. A major concern regarding safety and effectiveness of generic drugs is due to non-adherence to GMP (Good Manufacturing Practices) by pharmaceutical companies (Roy & Rana, 2018).

Interventions contributing to increase in usage of generic medicines were seen as educating masses, monetary incentives, and larger communication amongst health care professionals and patients (Hassali et al., 2009).

In a study conducted in Iraq, it was found that there were several obstacles to prescribing generic medicines such as doctors' unwillingness to prescribe generic medicines, mix-up over different brands and presence of counterfeit medicines (Sharrad & Hassali, 2011).

In a study (Kamejaliya et al., 2017) conducted at a tertiary care teaching hospital in West India, it was found that the majority of the respondents held the opinion that generic medicines are low in prices because of low-grade quality (71.9%), have unsure efficacy in serious diseases (44.6%), can be prescribed in all diseases (61.9%) and prescription of generic medicines should be mandatory (37%). The doctors preferred brands over generic medicines due to reasons such as concern about efficacy (100%), concern about safety (61.57%), poor availability of generic medicines (57.85%), inadequate availability of information (33.06%). Maximum respondents did not consent to substitution of prescribed branded medicine with a generic one by pharmacist due to doubts about quality, effectiveness and safety of generic medicines and hence, may not desire substitution of former. 80.9% doctors were of thinking that outcome of treatment may not change in substituting a brand-name medicine with an equivalent generic alternative (Gupta et al., 2018).

If a doctor prescribes a medicine in generic name without the brand name, then in all probability, the decision on choice of medicine will be with the chemist who may dispense another branded generic or a generic of suspect quality (Soans, 2022).

Based on the literature review as illustrated previously, the components of the questions for the study have been identified which are given in the Table 1.

Table 1 Components of practice related items with reference to previous studies

Component of practice related items	Previous Study
<i>Price-Quality parity of generic drugs</i>	(Badwaik et al., 2015; Kamejaliya et., 2017)
<i>Price- Quality parity of generics at Janaushadhi</i>	
<i>Rewards to doctors for prescribing generics</i>	(Badwaik et al., 2015)
<i>Substitution of branded drugs with generics</i>	(Badwaik et al., 2015; Gupta et al., 2018; Kamejaliya et., 2017)
<i>Liberty to choose generics by patient</i>	(Badwaik et al., 2015)
<i>Hesitation in prescribing in some diseases</i>	(Badwaik et al., 2015)
<i>Influence of personal experiences with medicines</i>	(Badwaik et al., 2015)
<i>Influence by patients' demands)</i>	(Badwaik et al., 2015;Gupta et al., 2018)
<i>Consideration of socioeconomic status of patients for prescribing medicines</i>	(Gupta et al., 2015; Singh et al., 2016)
<i>Easy remembrance of brand names</i>	(Badwaik et al., 2015; Gupta et al., 2018)
<i>Influence of medical reps</i>	(Gupta et al., 2015; Gupta et al., 2018; Badwaik et al., 2015)
<i>Availability of medicines</i>	(Gupta et al., 2015)
<i>Outcome of therapy with switching from brands to generics</i>	(Gupta et al., 2015; Badwaik et al., 2015; Kamejaliya et., 2017; (Gupta et al., 2018)
<i>Comparison of safety & efficacy of generic vs. brand name medicines</i>	(Gupta et al., 2015; Singh et al., 2016; Gupta et al., 2018)
<i>Awareness seminars to prescribe generic drug</i>	(Gupta et al., 2015; Gupta et al., 2018)
<i>Published Literature on generic drugs</i>	(Singh et al., 2016)
<i>Mandatory prescribing of generics</i>	(Kamejaliya et., 2017)

Objective and methodology

The objective of the paper is to evaluate and identify critical areas concerning influence of practice of doctors towards generic medicines with an aim to bring forth recommendations in addressing the regulatory policy / framework. The study also provides understanding of issues around practice which the pharmaceutical companies may look at from the perspective of marketing aspects of generic medicines.

The questionnaire based descriptive observational study was conducted in North India at Dehradun district of Uttarakhand spanning over a year in 2020 among doctors practicing in primary, secondary and tertiary healthcare centers.

Research Design

The basic research design process used in the study is descriptive. Further, the study is cross-sectional in nature so as to describe the statistical significance in association between the variables.

Instrument Development

The steps followed in the development process of the instrument included:

- Identification of questions from various studies.
- Refinement and paraphrasing of items in confirmation with our research objectives
- Critical review of developed questionnaire by select few medical practitioners
- Pilot testing with a select 48 doctors to validate the content and clarity of the questionnaire

The section of the questionnaire included seventeen items on 'practice' and one item on 'prescribing of generic medicines'. All items are in Likert-type scale.

Sampling

The membership list of doctors of Indian Medical Association Uttarakhand located within the talukas of Dehradun district formed the population of the study which comprised 671 doctors. Systematic random technique was used to determine the sample.

Sample size

Assuming the highest variability of 50% and designing for a $\pm 5\%$ sample error at 95 percent level of confidence, the number of respondents estimated is 179 (Burns & Bush, 2003).

Calculations for sample size (n) was determined as follows:

$$n = (Z_{\alpha/2})^2 pq/d^2 = [(1.96)^2 * (50^2)]/5^2 = 384$$

$$d = Z_{\alpha/2} \sqrt{[(1/n + 1/N)pq]} = 1.96 \sqrt{[(\frac{1}{384} + \frac{1}{671}) * (50 * 50)]} = 6.2671$$

Where

N = population size,

p = 50% unknown,

q = 50% (100 - p), d = 5%,

α = 5% level of significance.

Minimum sample size

$$= (Z_{\alpha/2})^2 pq/[d^2 + (Z_{\alpha/2}^2 pq/N)] = 1.96^2 * 50^2 / [6.2671^2 + (1.96^2 * 50^2 / 671)] = 179$$

Type of survey

The questionnaire designed for the study was self-administered amongst medical practitioners with face to face interaction. Due to restrictions imposed during the Covid 19 pandemic, telephonic interviews, email and google-form were also used to collect responses from the

medical practitioners. In all 228 doctors responded to the survey instrument.

The sample data was compiled in excel and analyzed using SPSS 25 for analysis. P values of ≤ 0.05 were considered to indicate statistical significance.

Analysis and interpretations

Table 2 summarizes the demographic of the participants. Table 3 includes responses to practice related questions. Graphical representation of frequency of responses of the respondents against the practice-related questions is shown in Figure 1

Table 2 Demographic details of the participants

		Frequency	Percent
Gender	Male	168	73.7
	Female	60	26.3
	Total	228	100.0
Age Group	<30	4	1.8
	31-40	47	20.6
	41-50	59	25.9
	51-60	39	17.1
	>60	79	34.6
	Total	228	100.0
Healthcare Center Type	Primary Care	56	24.6
	Secondary Care	85	37.3
	Tertiary Care	87	38.2
	Total	228	100.0
Employment	Self-employed	106	46.5
	Govt. Hospital	39	17.1
	Pvt. Hospital	78	34.2
	Charitable Hospital	5	2.2
	Total	228	100.0
Qualification Categorization	UG Degree	27	11.8
	PG Diploma / Degree	184	80.7
	Post PG Degree	17	7.5
	Total	228	100.0
Specialty Categorization	Non-Surgical	128	56.1
	Surgical	100	43.9
	Total	228	100.0

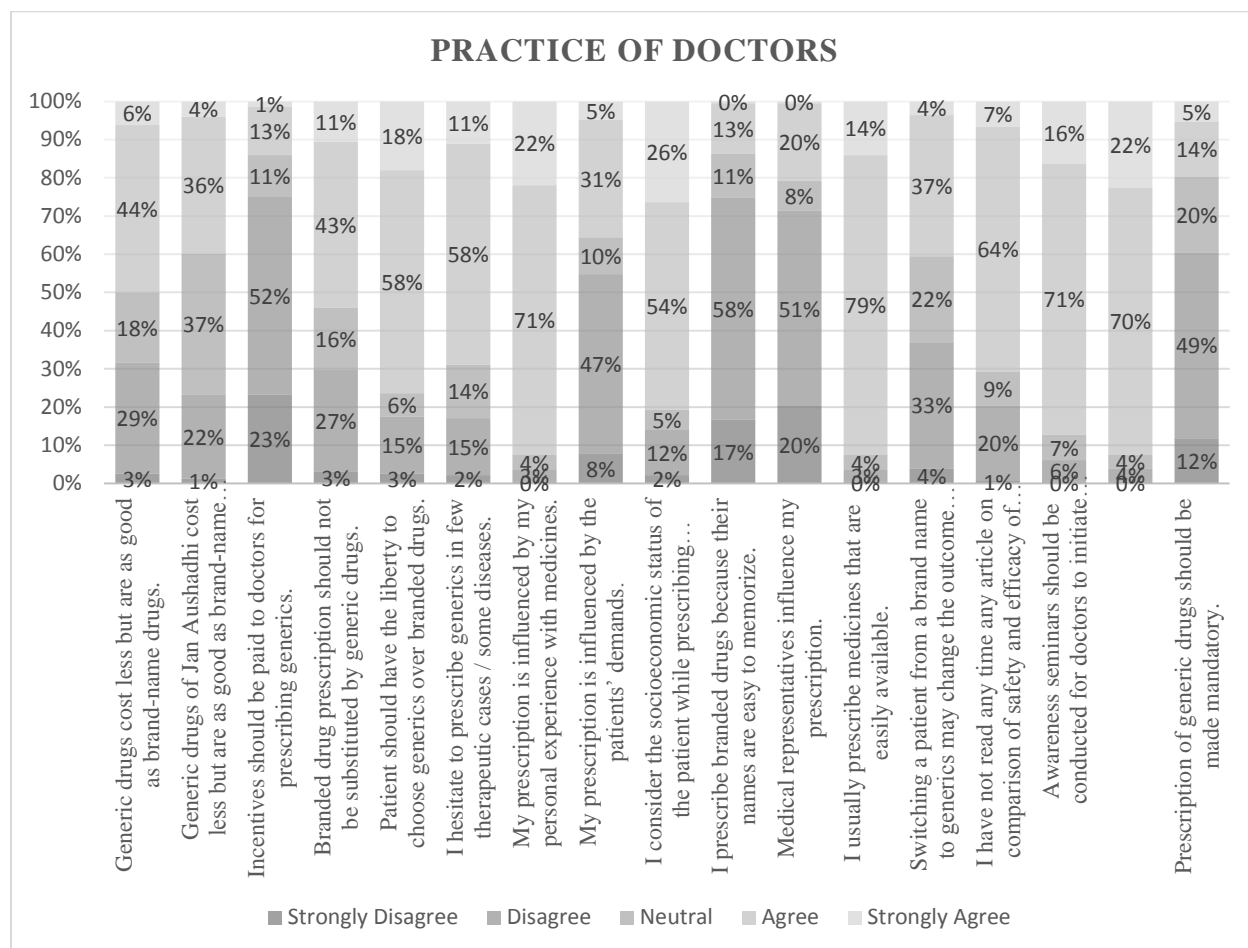
Source: Author's Compilation

Table 3 Practice related questions along with frequency (numbers and %) of responses

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Generic drugs cost less but are as good as brand-name drugs.	6	66	42	100	14
	2.6%	28.9%	18.4%	43.9%	6.1%
Generic drugs of Janaushadhi cost less but are as good as brand-name drugs.	3	50	84	82	9
	1.3%	21.9%	36.8%	36%	3.9%
Incentives should be paid to doctors for prescribing generics.	53	118	25	29	3
	23.2%	51.8%	11%	12.7%	1.3%
Branded drug prescription should not be substituted by generic drugs.	7	61	37	99	24
	3.1%	26.8%	16.2%	43.4%	10.5%
Patient should have the liberty to choose generics over branded drugs.	6	34	14	133	41
	2.6%	14.9%	6.1%	58.3%	18%
I hesitate to prescribe generics in few therapeutic cases / some diseases.	5	34	32	132	25
	2.2%	14.9%	14%	57.9%	11%
My prescription is influenced by my personal experience with medicines.	1	7	9	161	50
	0.4%	3.1%	3.9%	70.6%	21.9%
My prescription is influenced by the patients' demands.	18	107	22	70	11
	7.9%	46.9%	9.6%	30.7%	4.8%
I consider the socioeconomic status of the patient while prescribing medicines.	5	27	12	124	60
	2.2%	11.8%	5.3%	54.4%	26.3%
I prescribe branded drugs because their names are easy to memorize.	38	132	26	30	1
	16.7%	58.1%	11.5%	13.2%	0.4%
Medical representatives influence my prescription.	46	116	18	46	1
	20.3%	51.1%	7.9%	20.3%	0.4%
I usually prescribe medicines that are easily available.	1	7	9	179	32
	0.4%	3.1%	3.9%	78.5%	14.0%
Switching a patient from a brand name to generics may change the outcome of the therapy.	9	75	51	84	8
	4.0%	33.0%	22.5%	37.0%	3.5%
I have not read any time any article on comparison of safety and efficacy of generic vs. brand name medicines.	2	44	20	144	15
	0.9%	19.6%	8.9%	64%	6.7%
Awareness seminars should be conducted for doctors to initiate prescription of generic drugs.	1	13	15	162	37
	0.4%	5.7%	6.6%	71.1%	16.2%
Published literature on generic drugs will develop doctor's confidence for its prescription.	1	8	8	159	51
	0.4%	3.5%	3.5%	70%	22.5%
Prescription of generic drugs should be made mandatory.	27	111	45	33	12
	11.8%	48.7%	19.7%	14.5%	5.3%

Source: Author's Compilation

Figure 1 Graphical representation of responses to practice related questions



Source: Author's Compilation

50% of the doctors agree that generic medicines are inexpensive and as efficacious as brand name drugs, however, when it comes to generics at Janaushadhi stores, only 40% of the doctors are in agreement. A point to be noted, 37% of doctors, the highest neutral response amongst practice items, are undecided with regards to quality of generics at Janaushadhi stores.

Majority of doctors (75%) disagree with incentives for prescribing generics. 54% agree with non-substitution of their branded prescription with generic medicines. 76% agree with liberty to patients for choosing generic alternatives over branded drugs. 69% agree with hesitation in prescribing generics in some diseases. Overwhelmingly (93%) agree that their

prescription is influenced with their personal experience with medicines. 55% do not agree to having been influenced in prescribing medicines by patients demands. Overwhelmingly, 80% consider socio-economic status of patients while prescribing medicines. Majority (75%) disagree with prescribing branded drugs due to easy remembrance of brand names. 71% do not get influenced by medical representatives in prescribing medicines. 93% prescribe medicines that are easily available. Responses, 41% (agree) and 37% (disagree) were divided between on change of outcome of therapy with change of medicine to generics. 71% of doctors have not read any article detailing comparison of branded and generic medicine on efficacy and safety. 87% agree with conduct of seminars for doctors for promotion of generic medicines. 92% consented to development of confidence in prescribing generic medicines with published literature. Majority of doctors (61%) disagree with mandatory prescribing of generics.

The responses of doctors towards prescribing generic drugs is shown in table 4.

Table 4 Responses (frequency & %) of doctors towards prescribing generic drugs

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I usually prescribe generic drugs	6	64	66	76	16
	2.6%	28.1%	28.9%	33.3%	7.0%

To find out the statistical significance of how doctors' practice influence their prescription behavior towards generic medicines the research question was framed, "*Does practice of doctors play a significant role in influencing them in prescription generic medicines?*" Spearman's rank correlation was computed to assess the statistical significance between doctors' practice and prescribing of generic medicines. A positive correlation was found between the two variables, $r(221) = 0.45$, $p < 0.01$ Test results are given in table 5

Result of the Spearman correlation indicated that there was a significant moderate association between doctors' practice and prescription of generic medicines. It may be concluded that the practice being followed by doctors plays a significant role in influencing them in prescribing less of generic medicines.

Table 5 Spearman test results

		Practice items	Prescription of generic medicine
Spearman's rho	Practice items	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	221
	Prescription of generic medicines	Correlation Coefficient	.450**
		Sig. (2-tailed)	.000
		N	221

** . Correlation is significant at the 0.01 level (2-tailed).

According to the analysis of the responses, a good percentage of respondents were found to be having practice that favors branded medicines. As per the Kruskal-Wallis test, no change in practice was found between male and female doctors, in different age groups of doctors, doctors practicing at different healthcare centers (primary, secondary, tertiary), in different employment status (self-employed, govt. hospital, pvt. Hospital), doctors qualified with UG degree, PG diploma/degree, Post-PG degree and having non-surgical & surgical practice.

A mixed response, major similarities and few contrasts, was observed in comparison to previous studies.

Majority of doctors in this study and previously conducted disagree with quality of low-priced generics at par with branded medicines (Billa et al., 2014; Badwaik et al., 2015; Kamejaliya et al., 2017; Tripathi & Bhattacharya, 2018; Aivalli et al., 2018; Roy & Rana, 2018).

In this study 71% of doctors disagree with getting influenced by medical representatives in prescribing medicines which is in major contrast to another study (Narayan et al., 2020) in which 62% of doctors acknowledge having been influenced by medical representatives. However, multiple studies have shown that the promotional marketing strategies by pharmaceutical companies is influencing doctors in prescribing branded medicines (Chua et al., 2010; Bachheti & Saklani, 2013; Aivalli et al., 2018; Shetti & Khanna, 2019).

69% of doctors in this study compared with 44.6% in previously conducted (Kamejaliya et al., 2017) agreed with hesitation in prescribing generics in some serious diseases. In the study 41% agreed and 37% disagreed on change of outcome of therapy with change of medicine to generics in comparison to another study (Gupta et al., 2018) in which 80.9% doctors were of

thinking that outcome of treatment may not change in substituting a brand-name medicine with an equivalent generic.

Overwhelmingly, 93% doctors agree that their prescription is influenced with their personal experience with medicines and majority (54%) disagree with non-substitution of their branded prescription with generic by the chemists which was found to have similarity with the studies (Heikkila et al., 2007; Sanyal & Datta, 2011; Colgan et al., 2015; Kamejaliya et al., 2017).

Study was found to have commonality with the other study on consideration of socio-economic status of patients (Chua et al., 2010) & availability of products (Kamejaliya et al., 2017; Tripathi & Bhattacharya, 2018) by doctors while prescribing medicines.

Majority of doctors in this study disagree with incentives for prescribing generic medicines whereas in a study (Chua et al., 2010; Bachheti & Saklani, 2013) it is revealed that product bonuses / rewards influence doctors in their choice of medicines.

Majority of the doctors (71%) in the study have not read any article detailing comparison of branded and generic medicine on efficacy and safety, one reason for doctors (33.06%) preferring branded medicines is due to inadequate availability of information.

Over 60% of doctors in this study and previously conducted (Kamejaliya et al., 2017) do not agree with mandatory prescribing of generics.

Limitations

Articles published earlier than 2007 were not considered for review as they might be irrelevant with the present evolving practices. All the articles in all the databases including some of the paid articles may not have been captured in the search limiting complete review. Policy directives, initiatives, programs, schemes introduced in recent years by the government might have an effect on views of doctors.

Conclusion

Practice being followed by doctors has an influence on prescribing of generic medicines. Low prescription of generic medicines can be explained by practice of doctors favoring prescription of branded medicines due to factors such as hesitation in prescribing generics in all the diseases, satisfying experience with the previously prescribed medicines, availability, change in outcome

with generic substitution, unavailability of information showing comparison of data on efficacy & safety between generics & brands and marketing promotional activities by pharmaceutical companies.

Recommendation

Regulatory & marketing intervention in following areas is recommended that may lead to wider acceptance and usage of generic medicines.

- I. Quality of generics may be demonstrated at par with innovators' product.
- II. Availability of generics may be widespread improving reach and affordable accessibility.
- III. Periodic testing of branded generics & generics (Janushadhi) samples from the different market regions may be conducted.
- IV. Educational /promotional campaigns supplemented with published literature showing comparison of efficacy & safety between generics and brands for diseases including critical or serious may be planned & implemented.

Scope of further research

Further research is needed in the following areas:

- i. To explore different interventions amongst doctors to nurture a positive attitude and patronage for generic medicines.
- ii. To evaluate regulatory policy framework for registration, labeling, pricing structure, distribution & marketing of generics that may build confidence in doctors towards prescribing generic medicines.
- iii. Building a trust in generics of unknown companies in absence of promotion by medical representatives is an area that needs to be explored from marketing perspective of generics.

Declarations

Conflict of interest

The authors disclose no conflict of interest.

Funding

The study received no funding from any agency in public, private or not-for-profit sectors.

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