

Study of Influencing Factors on Drug Prescribing Behavior of Practitioners in an Urban City of Eastern India

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Abstract

Background: Physicians are entrusted with the responsibility of assessing their patients' needs and prescribing drugs to improve their health. Rational prescribing is a significant topic that requires more attention in order to examine prescriber's behavior in clinical settings. Three broad influencing factors for the prescribing behavior were identified such as, physician's personal drug choice, pharmaceutical influence & patient factors.

Aim & Objectives: The study was performed to determine influential factors on prescribing drugs by the practitioners.

Materials & Method: A cross-sectional study was carried out among practitioners of hospital, private or dual setup based. An objective type of questionnaire was designed for them to assess their prescription. Analysis was done by using suitable statistical methods.

Results: Among hospital-based practitioners (n=45), 82.3% considered company's brand image, 88.9% notified regular promotions, 75.6% mentioned easy brand name and 68.9% accepted scientific information influenced their prescribing habits. Private practitioners (n=42) who participated in the survey enlisted common factors to be company's image 73.8%, brand Availability 71.4%, medical representative's rapport 61.9%, pharmaceutical promotional tools 80.9%, scientific information 66.7%, and personal drug preference 76.2%. On the contrary, dual practitioners (n=96) agreed upon their choice of drugs being affected by the company's image 89.6%, regular promotions 81.3%, brand availability 85.4%, lower priced drugs 61.5%, medical representative's rapport 79.2%, easy brand name 65.6%, International certifications 68.7%, pharmaceutical promotional Tools 82.3%, scientific information 76.1%, and personal experience 76.0%. The overall literacy status, behavior towards doctor and socioeconomic conditions of the patients have been enlisted as important factors of prescription pattern in 65.6%, 41.0% and 68.3% cases respectively.

Conclusion: This study highlighted the differences in perception among hospital based, private and dual practitioners in regard to choose of drugs and prescribing habits. The major influencing factors were found out to be low priced drug, medical representative's rapport, international certifications and promotional tools used by the pharmaceutical companies.

Nevertheless, patient factors like namely literacy, socioeconomic status and behavior of the patients also played a vital role on physician's selection of drugs.

Keywords: Prescription Influencing Factors, Prescribing Behavior, Promotional Tools, Practitioners, Prescribing Pattern.

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Introduction

Globally, India gained third position in terms of quantity and 14th ranks in terms of value in pharmaceutical annual turnover of rupees 289,998Cr in the year 2019-20 and despite on COVID-19 restrictions till the September 2021, total pharmaceutical export was rupees 87864Cr and total import of rupees 33636Cr with a trade surplus of rupees 54228Cr.[1] India has many national & international pharmaceutical plants in different parts of the country, including US-FDA approved plants which accounts second highest in number.[2], [3] India is the largest supplier of generic medicines with 20% share in the global supply by manufacturing 60000 different generic brands across 60 therapeutic categories. [1]

The large proportion of the pharmaceutical market is principally derived from prescriptions of practitioners. Company work force (marketing and sales division) plays basic role and continuously attempt to persuade practitioners to endorse their possess company brands by individual offering, clinical gatherings, workshops, symposia, *etc.* Doctors take these aspects into account when writing prescriptions, and they utilize brand names for treatment, which patients compel to purchase. It is strictly prohibited to advertise prescription drugs for sale directly to consumer in mass media in India. [4] Sales representatives make regular calls to prescribers to share information on the scientific basis for their products and to point out comparative benefits of their products over other competitors. [5] Practitioners take these things into account when writing prescriptions, and they employ promoted

brands for treatment, which patients purchase. Certain other influencing factors like, cost of drugs, international certifications, drug quality through company image and the scientific information have been also known to affect doctor's prescription pattern in healthcare facilities. Other components include patient pressure and socioeconomic conditions, literacy status, nature of illness, and doctor-patient interaction. These variables have varying degrees of influence on the preparation prescription.

It is important to evaluate the behavior of prescribers when making rational prescriptions and should not be influence by any external factor.[6] Therefore, the study was performed to determine influential factors on practitioners in prescribing drugs, which further can be utilized as a very important tool or guidance for prescribers in prescribing rational prescriptions.

Materials and Methods

A cross-sectional study was carried out between March 2017 to September 2018 among qualified practitioners attached with teaching hospital and also with private hospitals/ clinics at vicinity of IMS & SUM hospital, Bhubaneswar, irrespective of their sex, specialization and year of experience. Non-practicing doctors and medical interns were excluded from this study. An objective type of questionnaire and consent form was structured carefully and further validated. The structured questionnaire was designed with the objective to assess the influence

of their prescription pattern. The institutional ethical committee approval was taken prior to this study.

The assessment was made on the basis of 5 point Likert Scale, the strong rejection was having minimum value 1, & strong acceptance having highest 5. [7] All data input, format, transformation and analysis were performed using Microsoft Excel 2007 and SPSS 20 version.

Results and Discussion

During the study period, a total of 206 practitioners were contacted to participate in this study. Out of these 183 practitioners (Response rate 88.8%) willingly gave consent and participated. Dual practitioner (n 96, 52.5%) were participated more than double as compared to hospital-based practitioner (n 45, 24.6%) and private practitioner (n 42, 23.0%). The ratio of specialists (n=90) and non-specialists (n=93) were 1.03 and 51.4% practitioners having experience less than 10 years, which shows relatively younger population have been enrolled or contacted for the study. [Table 1]

The younger group of practitioners have lesser clinical experience and were still in learning phase of therapeutic reasoning skills unlike logical diagnostic and therapeutic thoughts. [8]

The comparative analysis of the subjective responses on total acceptance are shown in [Table 2]. The practitioners with less than 15 years of experience were looked for company image (72.3%), whereas only 14.2% of older practitioners were agreed for the same. The results showed specialist were more agreed than non-specialist for the company image and brand availability of the drugs. On further analysis revealed specialist were more inclined towards brand availability and personal drugs (P-Drug) than non-specialist ($p < 0.05$). [Table-3] This may be due to pharmaceuticals sale persons providing promotional drug detailing and free samples to the specialist on regular visits,

which in addition put prescribers under obligation to write promoted brands in their prescription. This type of direct prescriber- corporate relationship many times mutually beneficial as well as for the society, as newer effective and safer drugs could be introduced in the market after detailed study. Sometimes, this this relationship could be harmful as many company personals always try to oblige prescribers by providing gifts to increase in their sales and to remain in the competitive pharmaceutical world. The personal drug (P-drug) and scientific information of a particular drug also attributed the attitude for suitable selection of medicines for the patient by the specialist. On the other hand, results showed non-specialists given weightage to the easy brand name and low price of the drug. This may be due to many young physicians who were recently completed their undergraduate medical training were also considered for this study. The understanding regarding rational drug prescribing is to be taken under consideration of knowledge, which expand over-time by following senior medical and surgical practitioners rather following an evidence-based practice. [9] This values that the clinicians in the academic institutes should interpret the rationale behind every prescription to their junior doctors. [10], [11] Among hospital based, private and both setup practitioners, the hospital practitioners have given more influenced by company image and scientific information's on their prescription. On the other hand, private practitioners have more inclined towards personal drugs, company image and brand availability, whereas dual practitioners have considered company image, brand availability, scientific information and personal drug. The low-price drug has least importance in doctor's drug preference.

The pharmaceutical industry sustains on the doctor's prescription, therefore the marketing attempt by the pharmaceutical

companies usually targeted at them. [12] This includes personal selling, clinical meetings or seminars and also organizes clinical conferences in which pharmaceutical companies perpetually aimed to motivate clinicians to prescribe their brands. The use of gifts, including pens and coffee mugs embossed with pharmaceutical product names, has been prohibited by Pharma ethics guidelines since 2008 but still on practice in very minimal scale. [13] It has been shown that gifts, however small, influence the behavior of the recipient. [14]. A prescription has an impact on the health of the patient and may also have financial advantages for the practitioners and the pharmaceutical companies and this relationship is an ideal target for interventions aimed at reducing health care costs. The results revealed, hospital practitioners had given more importance to easy brand name and regular promotion by the companies, whereas private practitioners found more inclined towards promotional tools using by pharmaceutical companies which includes, gifts, provision of drug samples, and sponsoring continuing medical education. On the other hand, dual practitioners have considered promotional tools using by pharmaceutical companies, regular promotion and medical representative's rapport. [Table-4] A previous study already reported inter-personal relationship which followed by the regular visits companies sales representatives are the most valuable tools to influence prescription behavior of the practicing physicians. [7]

The overall influence of patient's depending on factors as literacy status,

socioeconomic conditions and behavior of the patients are shown in [Table 3 and 4]. The literacy level of the patients is an important determinant to make appropriate medical decisions which invariably influencing prescription behavior. An individual's health literacy capacity is always needed to understand the underlying illness and need for particular drug to maintain good health. It is the prescriber's responsibility to make them to understand the requirement of prescribed medicines as educated patient always seek medication information.[15] Also, educated patient knows that health care system in India, are under consumer protection act, 2019, which further pressurize health care providers to prescribe rationally. [16] The socioeconomic condition of the patient is another key factor which has moderate influence over prescribing choice. A study showed both specialist and non-specialists group have considered low priced drug is not always linked with drug's effectivity. [17] Our study also showed prescriptions of private and dual practitioner have more influenced by socioeconomic conditions and the literacy status of the patients, whereas hospital practitioners have considered influence more on the patient's behavior. [18] This may be due to hospital-based practitioner having internal medicine supply for admitted patients, and also having huge burden of patients in out-patient department. All study participants (practitioners) have considered 100% dependence on the disease status of the patient. [Table 4]

Table 1: Practice years distribution according to type of the practice

Experience (in years)	Non- specialist		Specialist		Total
	Participants	%	Participants	%	
1-5	43	86.0	7	14.0	50
6-10	13	29.5	31	70.5	44
11-15	3	17.6	14	82.4	17

16-20	5	16.1	26	83.9	31
21-25	8	80.0	2	20.0	10
26-30	12	70.6	5	29.4	17
31-35	5	50.0	5	50.0	10
> 35	1	25.0	3	75.0	4
Total	90	49.2	93	50.8	183

Table 2: Study responses in Likert Scale (Mean \pm SD)

Doctors Drug Preference						
Types of practice		Company image	Brand availability	Personal drug	Scientific information	Low price drugs
Non-Specialist (n 90)	Mean	3.9 \pm 0.7	3.7 \pm 1.0	3.7 \pm 0.8	3.7 \pm 0.9	3.2 \pm 1.4
Specialist (n 93)	Mean	4.2 \pm 0.7	3.9 \pm 0.9	3.9 \pm 0.9	4.4 \pm 0.8	3.2 \pm 1.2
Dual Practitioners (n 96)	Mean	4.2 \pm 0.6	4.3 \pm 0.9	3.9 \pm 0.9	3.9 \pm 0.9	3.4 \pm 1.2
Hospital practitioners (n 45)	Mean	3.9 \pm 0.9	3.6 \pm 1.1	3.5 \pm 0.5	3.7 \pm 0.8	3.1 \pm 1.5
Private Practitioners (n 42)	Mean	3.9 \pm 0.7	3.9 \pm 0.8	4.0 \pm 1.0	3.6 \pm 1.0	2.7 \pm 1.3
Total (n 183)	Mean	4.1 \pm 0.7	4.0 \pm 0.9	3.8 \pm 0.9	3.8 \pm 0.9	3.2 \pm 1.3
Pharmaceutical Company Influence						
Types of Practice		Medical representative's rapport	Easy brand name	International certifications	Promotional tools	Regular promotion
Non-Specialist (n 90)	Mean	3.5 \pm 1.0	3.7 \pm 1.1	3.6 \pm 0.7	3.5 \pm 0.8	3.8 \pm 0.9
Specialist (n 93)	Mean	3.7 \pm 0.7	3.7 \pm 1.0	3.5 \pm 0.8	3.8 \pm 0.8	3.8 \pm 1.0
Total (n 183)	Mean	3.6 \pm 0.9	3.7 \pm 1.1	3.5 \pm 0.7	3.6 \pm 0.8	3.8 \pm 1.0
Dual Practitioners (n 96)	Mean	3.8 \pm 0.7	3.8 \pm 1.0	3.7 \pm 0.6	3.9 \pm 0.7	4.1 \pm 0.8
Hospital Practitioners (n 45)	Mean	2.8 \pm 0.7	4.1 \pm 1.0	3.5 \pm 0.7	2.9 \pm 0.7	4.0 \pm 0.7
Private Practitioners (n 42)	Mean	3.9 \pm 1.0	3.2 \pm 1.2	3.3 \pm 0.9	3.9 \pm 0.8	2.8 \pm 0.9

Total (n 183)	Mean	3.6 ± 0.9	3.7 ± 1.1	3.5 ± 0.7	3.6 ± 0.8	3.8 ± 1.0
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Table 3: Comparative analysis of the differences in subjective responses on total acceptance between specialists and non-specialists (Accept+Strongly Accept) (n 183)

Variables	Specialists (n=93)	Non-specialists (n=90)	Significance P < 0.05
Doctors drug preference			
Company Image	14	16	0.609
Brand Availability***	32	14	0.001
Personal Drug*	34	20	0.016
Scientific information	28	23	0.336
Low price of drugs	37	47	0.201
Pharmaceutical Company Influence			
Medical representative's rapport*	31	46	0.015
Easy brand name	34	32	0.888
International certifications	42	35	0.390
Promotional tools***	22	42	0.001
Regular Promotion	27	31	0.431
Patient's dependent factors			
Literacy status	67	53	0.061
Socioeconomic conditions	64	61	0.880
Behavior of the patients	43	32	0.142
Disease status	93	90	*

Table 4: Comparative analysis of differences in subjective responses on total acceptance between hospital, private and dual practitioners (accept+ strongly accept) (N= 183).

Variables	Hospital practitioners (n=45)	Private practitioners (n=42)	Dual practitioners (n=96)	P value (p < 0.05)
Doctors drug preference				
Company Image	82.3%	73.8%	89.6%	0.089
Brand Availability**	40.1%	71.4%	85.4%	0.003
Personal Drug**	51.1%	76.2%	76.0%	0.010
Scientific information	68.9%	66.7%	76.1%	0.561
Low price of drugs*	53.3%	35.7%	61.5%	0.018
Pharmaceutical company influence				
Medical representative's rapport***	11.1%	61.9%	79.2%	0.000
Easy brand name	75.6%	50.0%	65.6%	0.052
International certifications**	51.2%	40.4%	68.7%	0.010
Promotional tools using by	13.4%	80.9%	82.3%	0.000

pharmaceutical companies***				
Regular Promotion***	88.9%	19.1%	81.3%	0.000
Patient's depending on factors				
Literacy status	40.0%	64.3%	78.1%	0.000
Socioeconomic conditions	51.1%	66.7%	77.0%	0.005
Behavior of the patients	73.3%	7.1%	40.6%	0.010
Disease status	100%	100%	100%	*

Conclusion:

The prescription generally depends on prescriber, company and patient factors. The study has highlighted few differences in the perceptions of hospital based, private or dual practitioner on prescribing pattern. The young doctors need more experience to write rational prescription and to choose P-drugs. The chief influencing factors observed in this study was low priced drug, medical representative's rapport, international certifications and promotional tools used by the pharmaceutical companies. There was also literacy status, socioeconomic status and behavior of the patients having influence on drug prescribing behavior.

References:

1. Annual report 2021-22, Department of Pharmaceuticals, Ministry of Chemical & Fertilizers, Govt. of India.
2. Annual report 2020-21, Department of Pharmaceuticals, Ministry of Chemical & Fertilizers, Govt. of India. <https://www.pwc.in/assets/pdfs/pharma/PwC-CII-pharma-Summit-Report-22Nov.pdf>
3. Lal A. Pharmaceutical drug promotion: How it is being practiced in India? *JAPI*. 2001; 49:266–73.
4. Habib MA, Alam MZ. "Business Analysis of Pharmaceutical Firms in Bangladesh: Problems and prospects". *J Bus Tech*. 2011;1(1):61-77.
5. Stein FS. Family Medicine's Identity: Being Generalists in a Specialist Culture? *Ann Fam Med* 2006; 4: 455-9.
6. Narendran, R, Narendranathan M. Influence of pharmaceutical marketing on prescription practices of physicians. *JIMA*. 2013;111 (1): 47-50.
7. Richir MC, Tichelaar J, Geijteman EC, de Vries TP. Teaching clinical pharmacology and therapeutics with an emphasis on the therapeutic reasoning of undergraduate medical students. *Eur J Clin Pharmacol*. 2008;64(2):217–224.
8. Ferdoush J, Chowdhury A, Parveen K, Ata M, Alam SS, Reza FH. A Survey of Factors Influencing Drug Choice and the Prescribing Attitudes Among Junior Doctors of Two Major Tertiary Care Hospitals in Chittagong City. *CMOS Hosp. Med. Col. J*. 2018;17(1):17–22.
9. Orme M, Sjoqvist F, Bircher J, Bogaert M, Dukes MN, Eichelbaum M, Gram LF, Huller H, Lunde I, Tognoni G. The teaching and organization of clinical pharmacology in European medical schools (W.H.O. Working Group on Clinical Pharmacology). *Eur J Clin Pharmacol*. 1990;38(2):101–105.
10. Orme M, Reidenberg M. The teaching of clinical-pharmacology in Europe and North- America. *Trends Pharmacol Sci*. 1989;10(6):224–226.
11. Lublóy Á. Factors affecting the uptake of new medicines: a systematic literature review. *BMC H. Ser. Res*. 2014; 14:1.

12. "New pharma ethics rules eliminate gifts and meals - USATODAY.com" [Last Accessed on January 31st 2022].
13. Wazana A. Physicians and the pharmaceutical industry, is a gift ever just a gift? JAMA 2000; 283: 373-80.
14. Koo M, Krass I, Aslani P. Enhancing patient education about medicines: factors influencing reading and seeking of written medicine information. Health Expectations. 2006; 9:174-187.
15. Nomani M, Rahman F. Consumer Protection Act, 2019 and Its Implications for the Medical Profession & Health Care Services in India. J Ind Acad F Med. 2019;41: 282-285.
16. Soremekun R, Omitiran B. Factors affecting physicians' prescription and pattern of prescription in the management of secondary infertility. Afr. J. Pharm. Pharmacol. 2014;8(48): 1205-1212.
17. Madjiténgar Rataïngar, Baba Diallo, Fidèle Binam, Alexandre Nkoum, Samson Nkoumou, Aboubacar S.T. KANE, Oumar SANGHO, & Aissata Koné dite Néné Tjini. Treatment of strokes in the emergency department of N'Djamena general hospital: study of delays, care and clinical course of patients in the first hours. Journal of Medical Research and Health Sciences, 2021;4(9), 1451–1455.