

DOI: <https://dx.doi.org/10.18203/2319-2003.ijbcp20205126>

Original Research Article

## Generic drugs: a study on awareness among medical students and interns

Manasa C. R.\*, Kalpana L., Veena R. M.

Department of Pharmacology, BGS Global Institute of Medical Sciences, Bangalore, Karnataka, India

**Received:** 16 October 2020

**Revised:** 18 November 2020

**Accepted:** 19 November 2020

**\*Correspondence:**

Dr. Manasa C. R.,

Email: [drmanasacr@gmail.com](mailto:drmanasacr@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** Use of generic drugs and its availability is one of the less discussed topics in the medical education but at the same time holds a lot of importance in providing affordable health care to the general public.

**Methods:** All 150 II MBBS students and 80 interns who were willing were included in the study. After explaining the aims and objectives and obtaining the informed consent, a set of 14 semi structured questionnaire were given to the students through an online link. A total duration of 15 minutes was given to complete the questionnaire and submit to prevent bias.

**Results:** Most of the students 98 (75.4%) believe that generic drugs are non-inferior to branded drugs compared to interns 33 (49.3%) who are still doubtful about its efficacy ( $p=0.0003$ ). Most of the students 101 (77.7%) and interns 52 (77.6%) think that composition, dose and indications are same as branded drugs ( $p=0.987$ ). 75 (57.7%) students and 25 (37.3%) of interns know that generic medicines are marketed only after the expiry of patent period of innovator drug ( $p=0.005$ ). About 102 (78.5%) students and 44 (65.7%) interns prefer to prescribe generic drugs to their patients ( $p=0.061$ ). Only 34 (26.2%) students and few interns 19 (28.4%) knew about jan aushadhi sugam app ( $p=0.744$ ).

**Conclusions:** Lack of awareness about the jan aushadhi sugam app and location of nearby generic stores was acting as the main hindrance in optimal utilization of generic drugs.

**Keywords:** Generic drugs, Branded drugs, Pradhana Mantri Bharathiya Jan Aushadhi Kendra, Jan aushadhi sugam

### INTRODUCTION

There has been a drastic rise in health-care expenses in the recent year due to multiple lab investigations, use of costlier branded medicines, advanced diagnostic procedures involving hi-tech equipment's, stringent safety and sterilization protocols, periodic hospital maintenance costs etc. Of all these medicines consume major portion of total money spent on healthcare.<sup>1</sup>

In many developing and underdeveloped countries, a large proportion of health expenditure is paid out of pocket by households which can lead to financial crisis,

thereby limiting access to health care, or can result in financial catastrophe or impoverishment.<sup>2,3</sup> Reducing these expenditures to minimum possible levels without affecting quality of health care will be a fruitful exercise.

The government of India has introduced generic medicines in 2008 with the sole purpose of providing affordable healthcare to the general public. The generic drugs were made available in Pradhan Mantri Bharatiya Jan Aushadhi Kendra (PMBJP). Increasing the use of generic prescription drugs may help curb the rising pharmaceutical cost without sacrificing the quality of health care.<sup>4-7</sup> Generic prescription drugs cost less and are bioequivalent to brand name drugs as they contain the

same active ingredients but may differ in color, shape, size, and other non-active ingredients.<sup>4,8,9-13</sup>

As we try to provide good-quality health-care system to the community with limited available resources, increased usage of generic medicines can improve affordability of the health care without compromising the quality.<sup>14</sup> Generic drugs may be marketed under the non-proprietary name or as a branded generic. Branded generic drugs have names derived from a combination of the manufacturer's name and the non-proprietary name.

This enables the manufacturer to market the product in a way similar to the proprietary product.<sup>15</sup> Once generic version of the innovator medicine is launched, the price of that medicine decreases substantially, which gives huge access to the larger number of patients.<sup>16</sup>

Spread of awareness about generic drugs among the patient population can happen mainly through the treating doctors. But nothing much has been emphasized about the usage of generic drugs in the medical syllabus. Hence there seems to be lack of complete knowledge about generic drugs among medical fraternity. This is acting as a hindrance for optimal utilization of generic drugs.

Many studies have shown that compliance of patients on generic drugs was far better as compared to their brand name counterparts.<sup>17,18</sup> Hence the present study was planned with the intentions to evaluate knowledge, attitude and practices of doctors regarding use of generic medicines and to identify the key areas, which may act as hurdle to mass scale use of generics and provide recommendations to reduce the same.

## METHODS

### Study site

The study was conducted at BGS Global Institute of Medical Sciences, Bangalore.

### Study design

A questionnaire-based cross-sectional study was conducted after taking institutional ethics committee approval. The duration of the study was from June 1st to July 1st 2020.

### Sample size

The sample size was calculated using the formula  $4PQ/L^2$ , where P=positive factor/prevalence/proportion, Q= 1-P, L=allowable error or precision or variability

### Inclusion criteria

The study was conducted on 2nd year MBBS students and junior resident doctors (interns).

### Exclusion criteria

Those who were not willing were excluded from the study.

### Methodology

After explaining the aims and objectives and obtaining the informed consent, a set of 13 semi structured questionnaire based on knowledge, attitude and practice (KAP) were given to the students through an online link to the students. A total duration of 15 minutes was given to complete the questionnaire and submit to prevent bias.

A KAP questionnaire containing 13 questions (11 questions pertaining to knowledge of generic medicines, and only 1 question related to attitude and practice towards generic medicines) was designed using the pattern of questions by similar studies.<sup>19,20,25</sup>

### Data analysis

The data will be entered in Microsoft excel and analyzed by using statistical software and descriptive statistics will be done and significance test will be conducted to test the association between perception regarding generic drug and other factors.  $P < 0.05$  will be considered statistically significant.

## RESULTS

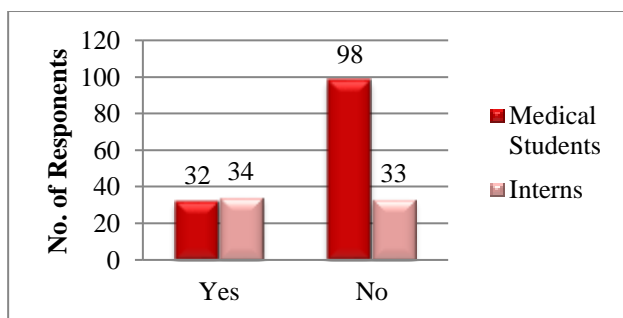
A total of 150 II-year MBBS students and 80 interns participated in the study. Out of 150 students 130 (86.6%) responded and out of 80 interns 67 (83.75%) responded to questionnaire. Most of the students were aged between 19 to 21 and most of the interns between 23 to 24 years old. (Table 1).

**Table 1: Demographic characteristics.**

Factors	Range (years)	
		MBBS interns
Age	18-20	102 0
	21-23	26 45
	>23	2 22
Total		130 (86.6%)
		67 (83.75%)

Most of the students 121(93.1%) and all interns 67(100%) knew about the generic drugs.

Total 46 (35.4%) medical students and 34 (50.7%) interns came to know about generic drugs through mass media, 57 (43.8%) students and 19 (28.4%) interns through social media and 43 (33.1%) students, 36 (53.7%) interns from senior doctors. Only students 43 (33.1%) and 47 (70.1%) interns knew that generic medicines are available only at pradhanamantri bharathiya jan aushadhi kendra.



**Figure 2: Generic drugs are non-inferior in efficacy to branded drugs.**

**Table 2: Knowledge, attitude and practice towards generic drugs.**

Questions	Medical students	Interns	P value
	N (%)	N (%)	
<b>Do you think generic drugs are as safe as branded drugs?</b>			
Yes	99 (76.2)	48 (71.6)	0.490
No	31 (23.8)	19 (28.4)	
<b>Do you think generic drugs are inferior in efficacy to branded drugs?</b>			
Yes	32 (24.6)	34 (50.7)	0.0003
No	98 (75.4)	33 (49.3)	
<b>Do generic drugs take longer time to act in body compared to branded drugs?</b>			
Yes	28 (21.5)	26 (38.8)	0.13
No	102 (78.5)	41 (61.2)	
<b>Composition, dose and indications of generic medicines are same as branded Medicine</b>			
Yes	101 (77.7)	52 (77.6)	Not
No	29 (22.3)	15 (22.4)	Significant
<b>Generic medicines only marketed after the Expiry of PATENT period of innovator drug</b>			
True	75 (57.7)	25 (37.3)	0.005
False	55 (42.3)	42 (62.7)	
<b>Do you prefer to use generic medicines for yourself or your relatives?</b>			
Yes	94 (72.3)	39 (58.2)	0.050
No	36 (27.7)	28 (41.8)	
<b>Do you prefer to prescribe generic medicines for your patients? (Once you start practicing in future)</b>			
Yes	102 (78.5)	44 (65.7)	0.061
No	28 (21.5)	23 (34.3)	
<b>Which one of them is true about jan aushadhi sugam app?</b>			
a) It will enable people to search for generic medicines	2 (5.9)	1 (5.3)	0.003
b) It will locate generic stores near you	0 (0)	4 (21.1)	
c) It will help in product comparison of generic versus branded medicines in the form of MRP and overall savings	1 (2.9)	0 (0)	
d) All of the above	31 (91.2)	14 (73.7)	

Nearly half of students 75 (57.7%) and some interns 25 (37.3%) knew that generic medicines are marketed only after the expiry of patent period of innovator drug. Most of the students 94 (72.3%) and half of the interns 39 (58.2%) prefer to use generic medicines for themselves or their relatives. Majority of students 102 (78.5%) and interns 44 (65.7%) prefer to prescribe generic drugs to their patients. However only 34 (26.2%) students and few interns 19 (28.4%) knew about jan aushadhi sugam app (Table 2).

Most of the medical students 111 (85.4%) and 40 (59.7%) interns believe that both generic drugs and branded drugs act similarly. 108 (83.1%) medical students and 173 (87.8%) interns knew that generic drugs cost less than that of branded drugs. Most of the students 98 (75.4%) think that generic drugs are non-inferior to branded drugs in efficacy compared to interns 33 (49.3%) who are still doubtful (Figure 1). Most of the students 99 (76.2%) and interns 48 (71.6%) think that generic drugs are as safe as branded drugs. Majority of the students 101 (77.7%) and interns 52 (77.6%) think that composition, dose and indications are same as branded drugs.

## DISCUSSION

Medical students and interns who are the future practitioners should know about the generic medicines and bioequivalence from the very beginning of medical course. Policy makers encourage generic drugs around the world to make the medicine affordable and more accessible and to decrease the cost of the health care system.<sup>21</sup> In this study almost all the interns 67 (100%) and students 121 (93.1%) were aware of term generic drugs which is similar to a study done by Choulera et al

where students (94.5%) and interns (74%) were aware of the concept of generic drugs.<sup>22</sup> Students were usually taught about generic drugs in 2nd year MBBS Pharmacology class; but they gradually tend to forget by the time they start internship. The source of information about generic drugs is varied among students and interns i.e., through mass media [46 (35.4%) and 34 (50.7%)], social media [57 (43.8%) and 19 (28.4%)] and through senior doctors [43 (33.1%) and 36 (53.7%)]. This is similar to a study done by Patil et al.<sup>23</sup>

In the present study only 43 (33.1%) of students and 47 (70.1%) of interns know that generic medicines are available only at Pradhanamantri Bharathiya Jan Aushadhi Kendra. Whereas in a study done by Prithul Bhattacharjee et al all the 120(100%) doctors knew about this. In the present study 111 (85.4%) medical students and 40 (59.7%) interns think that both generic drugs and branded drugs act similarly.<sup>24</sup> A similar finding was reported in previous study where 125 (86.21) of UG's and 45 (90) of interns believe that there is no difference their mechanism of action and is bioequivalent to branded drugs.<sup>25</sup> In the present study 108 (83.1%) medical students and 173 (87.8%) interns knew that generic drugs are less expensive compared to branded drugs, which is similar to a study which suggests 129 (88.97) UG's and 36 (72) interns knew that cost of generic medicine is considerably lower than brand medicine.<sup>26</sup> As health-care cost is increasing as a result of the increased cost of medicines, use of generic medicine which is affordable is being validated by policy-makers worldwide.<sup>27</sup> Hence, it is important to educate and guide medical students about cost-effective use of medicine.<sup>28</sup>

There is strong misconception among medical fraternity that any drug which is expensive is better compared to a drug that is affordable, which is quite disgraceful. In this study 99 (76.2%) students and 48 (71.6%) interns think that generic drugs are as safe as branded drugs, whereas in a study done by Sahana et al shows that most of the doctors (90%) and interns believe that generic drugs are as safe as branded drugs (75%).<sup>27</sup> In our study 98 (75.4%) students understood that generic drugs are non-inferior to branded drugs in efficacy compared to interns 33 (49.3%), whereas in another study suggest that 54% students disagreed that generic medicines are of inferior quality to brand-name medicines.<sup>28</sup> Most of interns felt that advertisement by the drug companies would influence the utilization of brand-name medicine and even significant proportion of doctors, pharmacists and lay people hold negative perceptions of generic medicines. It's likely these attitudes present barriers to the broader use of generics.

In our study, 101 (77.7%) students and 52 (77.6%) interns think that composition, dose and indications are same as branded drugs whereas in another study suggest that 89.9% doctors had knowledge that composition, dose and indications of generic medicines were same as the branded counterparts ( $p < 0.0001$ ).<sup>29</sup> In current study only 75 (57.7%) of students and 25 (37.3%) of interns believe

that Generic medicines only marketed after the Expiry of PATENT period of innovator drug. This is similar to a study where only 42.8% students knew that generic medicines are manufactured after patent expiry of originator medicines.<sup>30</sup> This is a matter of concern to understand whether they have understood this concept clearly, which should be educated to them in more depth.

Most of the students 94 (72.3%) and half of interns 39 (58.2%) prefer to use generic medicines for themselves or their relatives. Another study suggests that (64.7%) students were more confident in prescribing using generic names rather than brand names because the curriculum deals with generic names more than brand names and (63.2%) found it easier to recall a medicine's therapeutic class using generic names rather than brand name.<sup>30</sup> In our study 102 (78.5%) of students and 44 (65.7%) of interns prefer to prescribe generic drugs to their patients. There should be a continuous stringent quality check of generic drugs by authorized government body. This will maintain the efficacy and safety of generic drugs and also help in keeping up the confidence among treating doctors. Only 34 (26.2%) students and few 19 (28.4%) interns knew about jan aushadhi sugam app, whereas in another study done by Badwail et al all participants were aware of jan aushadhi scheme of Govt. of India.<sup>20</sup>

### **Limitations**

The major limitation of our study was that the study was conducted by teachers from the same institute; this could have biased the responses from students. Study was restricted to only students and interns which could have extended to clinicians and general population. Since it is an online study there are more chances of students to check internet and answer the questionnaire.

### **CONCLUSION**

Majority of the medical students and interns were aware that generic drugs are similar to branded drugs with respect to efficacy, safety, composition, dose and indications. They also prefer to prescribe generic drugs to their patients as well as their own family members. However, lack of awareness about the jan aushadhi sugam app and location of nearby generic stores was acting as the main hindrance in optimal utilization of generic drugs.

### **ACKNOWLEDGEMENTS**

Corresponding author would like to thank the entire faculty in department of pharmacology, BGS GIMS.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

- Bakthavathsalam G. Generic drugs: cost effective alternative to branded drug. *Heal Administr.* 2006;19:16-9.
- Xu K, Evans DB, Carrin G, Aguilar-Rivera AM, Musgrove P, Evans T. Protecting households from catastrophic health spending. *Health.* 2007;26(4):972–83.
- WHO global health expenditure atlas. Geneva: World Health Organization; 2014. Available at: <http://www.who.int/health-accounts/atlas2014.pdf>. Accessed on 10 May 2020.
- Rizzo JA, Zeckhauser R. Generic script share and the price of brand-name drugs: the role of consumer choice. *Int J Health Care Fi.* 2009; 9(3):291-316.
- Shrank WH, Liberman JN, Fischer MA, Girdish C, Brennan TA, Choudhry NK et al. Physician perceptions about generic drugs. *Ann Pharmacother.* 2011;45(1):31-8.
- Shrank WH, Cox ER, Fischer MA, Mehta J, Choudhry NK. Patients' perceptions of generic medications. *Health.* 2009; 28(2):546-56.
- Shrank WH, Cadarette SM, Cox E, Michael A, Fischer, Mehta J, Alan M Brookhart et al. Is there a relationship between patient beliefs or communication about generic drugs and medication utilization?. *Med Care.* 2009;47(3):319-25.
- Kesselheim AS, Misono AS, Lee JL, Stedman MR, Brookhart MA, Choudhry NK, Shrank WH. Clinical equivalence of generic and brand-name drugs used in cardiovascular disease: a systematic review and meta-analysis. *J Am Med Assoc.* 2008;300(21):2514-26.
- Wilson IB, Schoen C, Neuman P, Strollo MK, William H, Rogers, Chang H et al. Physician-patient communication about prescription medication nonadherence: a 50-state study of America's seniors. *J Gen Intern Med.* 2007;22(1):6-12.
- Haas JS, Phillips KA, Gerstenberger EP, Seger AC. Potential savings from substituting generic drugs for brand-name drugs: medical expenditure panel survey, 1997–2000. *Anna Intern Medic.* 2005;142(11):891-7.
- Michael A, Fischer, Avorn J. what the experience of Medicaid and other insurance programs means for a Medicare drug benefit. *Pharmacoepidemiol Dr S.* 2004;13(4):207-14.
- Van Wijk BL, Klungel OH, Heerdink ER, de Boer A. Generic substitution of antihypertensive drugs: does it affect adherence?. *Ann Pharmacother.* 2006; 40(1):15-20.
- Babar ZU, Stewart J, Reddy S, Alzaher W, Vareed P, Yacoub N et al. An evaluation of consumers' knowledge, perceptions and attitudes regarding generic medicines in Auckland. *Pharm World Sci.* 2010;32(4):440-8.
- Jamshed SQ, Ibrahim MIM, Hassali MA, Masood I, Low BY, Shafie AA, et al. Perception and attitude of general practitioners regarding generic medicines in Karachi, Pakistan: a questionnaire-based study. *Southern Med Rev.* 2012;5(1):22-30.
- King DR, Kanavos P. Encouraging the use of generic medicines: implications for transition economics. *Croat Med J.* 2002;43(4):462-9.
- Lopes Gde L. Cost comparison and economic implications of commonly used originator and generic chemotherapy drugs in India. *Ann Oncol.* 2013;24(5):v13-6.
- 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. *Archives Inter Med.* 2006;166(3):332-7.
- Briesacher BA, Andrade SE, Fouayzi H, Chan KA. Medication adherence and the use of generic drug therapies. *Am J managed care.* 2009;15(7):450.
- Gupta SK, Nayak RP, Vidyarthi SK. A study on the knowledge, attitude and practice of generic medicines among the doctors in a tertiary care teaching hospital in South India. *Nation J Physiol Pharm Pharmacol.* 2015;5(1):39-44.
- Badwaik RT, Chopade SS, Mahajan HM, Honrao R. Prescribers Views on Generic Medicines: A Study on Knowledge, Attitude and Practice. *J Cont Med A Dent.* 2015;3(2):27-32.
- Hassali MA, Alrasheedy AA, Mclachlan A, Nguyen TA. The experiences of implementing generic medicine policy in eight countries: a review and recommendations for a successful promotion of generic medicine use. *Saudi Pharmaceut J.* 2014;22:491-503.
- Choulera MY, Dashputra Amruta V, Borkar AS, Date AP. Knowledge and perception about generic drugs in patients coming to OPD of tertiary care centre. *Int J Bas Clinic Pharmacol.* 2018;7(5):1024.
- Patil JR, Jaykare SC, Motghare VM, Padwal SL, Deshmukh VS. Awareness about generic drug prescription amongst practitioners: A knowledge attitude practice survey at rural set up. *Int J Basic Clin Pharmacol.* 2016;5(3):707-12.
- Bhattacharjee P, Das L, Ghosh R, Das UK, Chakraborty M. Knowledge, attitude and practice of generic medicines among doctors in a tertiary care teaching hospital of Tripura, India. *Int J Basic Clin Pharmacol.* 2017;6:1287-92.
- Singh AV, Dixit A, Kumar A, Pandey D, Singh CV, Pathak A. A cross-sectional study to compare knowledge and perception of generic medicine among medical students at a tertiary care center. *Nation J Physiol Pharm Pharmacol.* 2020;10(4):338-43.
- Hogerzeil HV. Promoting rational prescribing: An international perspective. *Br J Clin Pharmacol.* 1995; 39:1-6.
- Hebbar SK, Nalini GK, Deepak P, Sahana GN, Nagaral JV. Assessment of awareness of generic drugs among healthcare professionals and laypersons. *Int J Basic Clin Pharmacol.* 2017;6(3):680-3.

28. Deb A, Dhavalshankh AG, Burande MA, Patil SS, Tahashildar JC. Evaluation of Knowledge, Attitude and Perception about Generic Medicines among Medical Students and Interns in a Tertiary Care Hospital. *J Advanc Medic Dent Sci Res.* 2017;5(11):8-12.
29. Gupta R, Malhotra A, Malhotra P. A study on assessment of awareness on generic drugs among doctors in a tertiary care teaching hospital in north India. *Int J Res Med Sci.* 2018;6(4):1362-7.
30. Sharrad AK, Hassali MA. Knowledge and perceptions of final year medical students in Iraqi universities about generic medicines. *J Bioequival Bioavailab.* 2011;3:86-91.

**Cite this article as:** Manasa CR, Kalpana L, Veena RM. Generic drugs: a study on awareness among medical students and interns. *Int J Basic Clin Pharmacol* 2020;9:1877-82.