ASSESSMENT OF KNOWLEDGE AND PERCEPTION TOWARDS GENERIC MEDICINES AMONG UNDERGRADUATE MEDICAL STUDENTS IN A TERTIARY CARE HOSPITAL

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ABSTRACT
Background: Use of generic medicine is important to reduce rising health care costs. It is essential to impart proper knowledge towards generic medicines among undergraduate medical students. Hence this study was conducted. Objective: To study the knowledge and perception about generic medicines among undergraduate (UG) medical students in a tertiary care hospital. Methodology: A cross-sectional study was conducted among 100 UG medical students. Primary data were collected by self-administered questionnaire and analyzed using descriptive statistics method and results were expressed in Percentage. Results: Among 100 students age ranged from 18-22 years, with them Male 42%, Female 58% participated. Only 13% respondents provided the correct value of the regulatory bioequivalence limits. Total score of knowledge about generic medicine ranged from 13 – 26 with mean 19.25 ± 2.52. Total score of perception about generic medicine ranged from 13-30 with mean 22.67 ± 3.75. Conclusion: There was a significant knowledge gap with regard to the regulatory bioequivalence limits for generic medicines and use of these medicines which must be corrected through appropriate education. Deficiencies in the study were noted and we intend to strengthen knowledge about generic medicines through continuous training for the undergraduate students.

KEYWORDS: generic medicine, knowledge, perception.
INTRODUCTION
A “generic medicine” is a multisource pharmaceutical product which is intended to be interchangeable with the comparator product. It is usually manufactured without a licence from the innovator company and marketed after the expiry of patent or other exclusivity rights.[1] Medicine is an important product that serves to reduce morbidity and mortality as well as improve quality of life although only one-third of the global population can access adequate medical care. More than half of the population of certain developing countries in Asia and Africa has no access to essential medicines.[2]

The World Health Organization defines a generic product as a pharmaceutical product that has the same utility as an innovative product but is produced without a license from the company that created it following the expiration of the patent.[3] Globally, health-care costs have been increasing rapidly and governments have adopted cost containment measures in an attempt to ensure efficient utilization of scarce resources. One of the important mechanisms to reduce health-care costs is to promote the use of cheaper generic medicines instead of more expensive branded equivalents.[4] The price of generic medicine is cheaper than that of brand name drugs. For instance, the Congressional Budget Office (CBO) has found that generic medicines are 75% cheaper than brand name medicines, and hence, they saved 93 billion US dollars for the health-care system in 2010.[5]

A research program of the CBO conducted with senior citizens with disabilities showed that the cost for medical plans or the pharmacies will be reduced by about 55% if generic medicines are used instead of the brand name medicines.[6] The savings made on the use of generic medicines can help the government to focus its financial resources on developing new services for patients as an urgent goal.[7] The usage of generic medicines is high in industrialized countries where price levels for pharmaceuticals are usually high. In the United States (US), over the period from 2003 to 2012, generic medicines have resulted in savings of US$ 1.2 trillion to the health-care system.[8] In the US, generic medicines account for approximately 75% of prescriptions but incur only 13% of the cost of newer, innovative, and more expensive medications.[9] During the year 2006, generic medicines accounted for 42% of dispensed packs among 27 European countries, but the cost was only 18% of the total pharmaceutical expenditure. A study published in 2004 concluded that the combined effect of federal price regulations, provincial price freezes, and generic substitution policies have been effective in controlling price-related determinants of drug spending in Canada.[10]
One reason for this lack of knowledge on the part of doctors could be the limited scope of college programs concerning the concept of generic medicines, which may need to be supplemented by additional education to enhance the future use of generic medicines.[11]

Othman and Abdulghani (2015) found that more than 70% of students believed that the generic medicine was lower quality and less effective than the brand-name medicine. That results needed for distinctiveness and prevention pre-registrants to contribute inappropriately to generic medicine use.[12] Another study comparing the knowledge and perceptions of senior medical students and pharmacy preregistrants in Australia found that though there were few differences in response, both groups had knowledge deficiencies about the quality, safety, and effectiveness of generic medicines which may need to be addressed by educational curricula.[13]

Students’ perception about generic medicines has not been previously studied in our institution. Hence, the present study was conducted to study the knowledge and perception towards generic medicines among undergraduate medical students in our institution.

MATERIALS AND METHODS

Study design and study sample

A cross-sectional study was conducted among 100 basic science undergraduate medical students at Karpaga Vinayaga Institute of Medical Sciences and Research Centre, Madhuranthagam, during the month of September 2017. A previously developed and validated survey was used to study the student’s knowledge and perception about generic medicine. The study questionnaire included 14 questions divided into four sections. The first part consisted of three demographic questions, about age, gender and university. The second part of the single questionnaire is about Knowledge of respondents toward bioequivalence. The third part of the questionnaire contained six questions that to access the Knowledge of medical students about generic medicines. The fourth part of the questionnaire consisted of six questions that to access the Perception of medical students about generic medicine, six questions framed for responses on a five-point Likert-type scale. The scale was 5= strongly agree with the statement, 4= agree, 3= neutral, 2 = disagree, and 1= strongly disagree with the statement. The questionnaire were administered to the students after obtaining informed consent and 30mints was given to fill the details.
Data analysis
The obtained data was analysed with descriptive statistical methods and the results were expressed in percentage.

Ethical approval
Ethical approval for this study was received from the institutional ethical committee of karpaga vinayaga institute of medical sciences & research centre EC Ref. No: 77/2017 dated 7/7/2017. Participation in the study was entirely voluntary, informed consent was obtained and all collected information was anonymous and used only for research purposes.

RESULTS
1. Respondent demographics
Overall 100 undergraduate medical students participated with aged range from 18-22 years, with them male 42 and female 58.

![Bar chart showing gender distribution among respondents](image)

Fig 1: Shows 100 students age ranged aged ranged from 18-22 years, with them male 42%, female 58% participated.

2. Knowledge of respondents toward bioequivalence.
On their knowledge of regulatory bioequivalence limit, students were asked to choose the correct allowed bioequivalence limits when comparing a generic medicine with an innovator branded product. Six options were presented from which they were asked to select the correct answer. The allowed bioequivalence limit is 80–125%. We grouped their responses into two categories: “yes” or “no.” Based on their responses, only 13 students chose the correct answer (13%), while the rest chose the wrong answer (87%). To determine the association between the course of study and knowledge of bioequivalence limit, the “I do not know” option was considered as an incorrect answer.
Fig. 2: Shows only 13% respondents provided the correct value of the regulatory bioequivalence limits.

There were agreement-type six questions relating to knowledge. The total score of knowledge about generic medicine ranged from 13-26 with mean 19.25 +/- 2.52. Totally 34% respondent strongly agree generic medicine is bioequivalent to a brand-name medicine while 19% respondents strongly disagree generic medicines are less effective compared to brand-name medicines. 35% respondents disagree generic medicines produce more side effects compared to brand-name medicines.

Fig. 3: Shows total score of knowledge about generic medicine ranged from 13-26 with mean 19.25 +/- 2.52.
4. Perception of medical students about generic medicines

There were agreement-type six questions relating to perception. Total score of perception about generic medicine ranged from 13-30 with mean 22.67 +/- 3.75. Totally 41% respondents strongly agree a need of standard guideline to medical prescribers on brand name medicine substitution process and 41% agree a need of more information on the issues pertaining to the safety and efficacy of generic medicines. Where 17% disagree hospital budget for drug procurement will affect my future choice of medicines.

![Fig. 4: Shows total score of perception about generic medicine ranged from 13-30 with mean 22.67 +/- 3.75.](image)

**DISCUSSION**

Medical educators have an important role to educate the future doctors about the cost effective use of medicines.\[^{14}\] Increasing use of generic medicines would reduce the cost of pharmaceutical expenditure to both the health-care system and to individual consumers.\[^{15}\]

Recently Government of India emphasised the use of generic medicines in the prescription of medical practitioners to reduce the burden of cost for the public. Still In India, there is a widespread distrust of the quality control practiced by manufacturers of generic drugs. Hence there is an immense need for the improvement of the quality control system in the production of generic medicines and promote the education about the usage of generic medicines among doctors.
A qualitative study conducted in Pakistan, among dispensing doctors had shown sparse knowledge about the generic medicines.\textsuperscript{[16]} In a study conducted in Australia, the respondents perceived generic medicines to be inferior in quality, less effective, produced more side effects, and were less safer compared to brand-name medicines. Deficiencies in knowledge and problems with perception toward generic medicines were noted in a study conducted among general practitioners (GPs) in Ireland.\textsuperscript{[17]} A similar finding was noted among GPs in a northern state of Malaysia.\textsuperscript{[18]} The authors concluded that GPs seem to have largely accepted the use of generic medicines but still had concerns about the quality and reliability of such products. In contrast, the results of a study conducted in the United States found that 68\% of participants believed in the safety of the drug. However, it has been suggested to be common knowledge that generic drugs are of weak quality.\textsuperscript{[19]}

In our study, also only about 13\% of respondents were aware of the correct limits of bioequivalence. Overall knowledge about generic medicines among undergraduate medical students was 20\% and perception was 24\%. Although the number of respondents who participated in the study is small, the findings do suggest that lack of knowledge to generic medicines needs to be addressed among the future practitioners. It is imperative to impart knowledge about generic medicines among undergraduates who are future practitioners. Education could be intervened through interactive lectures and activity based training sessions. Deficiencies were noted in the study and we intend to train the students to strengthen knowledge about generic medicines periodically.

**CONCLUSION**

There was a lack of knowledge and perception with regard to the regulatory bioequivalence limits and use of generic medicines. The knowledge gap must be corrected through appropriate education and training among undergraduate medical students.

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CONFLICTS OF INTEREST
There are no conflicts of interest.

REFERENCES


