



[PROJECT ON]

A cross-sectional analysis of undergraduate pharmacy students' knowledge and attitudes about the use of generic medications

SUBMITTED TO

The Department of Pharmacy
Faculty of Allied Health Sciences
Daffodil International University

SUBMITTED BY

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A cross-sectional analysis of undergraduate pharmacy students' knowledge and attitudes about the use of generic medications

APPROVAL

This project, “A cross-sectional analysis of undergraduate pharmacy students' knowledge and attitudes about the use of generic medications”, submitted to the Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, and has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of Bachelor of Pharmacy and has been approved as its style and content.

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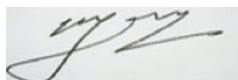
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Certificate

This is to certify that the results of the investigation that are embodied in this project are original and have not been submitted before in substance for any degree of this University. The entire present work submitted as a project work for the partial fulfilment of the degree of Bachelor of pharmacy, is based on the result of author's (ID: 171-29-014) own investigation.

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DECLARATION

I hereby declare that, this project report is done by me under the supervision of MD. MIZANUR RAHMAN, Assistance professor, Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, impartial fulfilment of the requirement for the degree of Bachelor of Pharmacy. I am declaring that this project is my original work. I am also declaring that neither this project nor any part thereof has been submitted elsewhere for the award of Bachelor or any degree.

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Author



DEDICATED TO

My parents and my supervisor



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ABSTRACT

Background: Some people are worried about generic medicines because these are much cheaper than brand-name medicines. They think that generic medicine compromises in terms of quality and effectiveness because it is cheap. But according to the FDA's (U.S. Food and drug administration) requirements, generic medicines must be as safe and effective as brand-name medicines. In fact, generic medicines are much cheaper because manufacturers do not have to spend extra money to develop and market a new drug. Upon expiration of the patent, manufacturers may apply to the FDA to produce and sell generic versions of the drug. Although the production and sale of generic versions of medicines are already in vogue in different countries of Europe and America, India is also doing well in this sector. In Bangladesh most of the companies manufacture generic medicine but in ground level people doesn't have much more good knowledge. That's why people may have various misconceptions and rumours, so the main purpose of this study is to know the attitudes of people towards generic medicine, to take their feedback and to analyse them.

Objectives: The aim of this study was to assess and analysis of undergraduate pharmacy students' knowledge and attitudes about the use of generic medications.

Method: A cross-sectional online based survey preform form March to May 2021, among the undergraduate pharmacy students at Daffodil International University in Bangladesh. A 25-item questionnaire was developed, validated and administered on the participant. 100 students are responded to this survey.

Results: The majority of person (93%) claimed that they knew about generic drugs. And most person (47%) get information from their teachers. There was a misconception among respondents about the concepts of "efficacy", "safety", "bio-equivalence", and "manufacturing standards" of generic medications, 76% believed that generic medications are bioequivalent to brand-name medicines. On the other hand 29% said that generic medications are less effective than brand-name medicines. 71% believe that a standard guidance required for both GPs and pharmacists on the brand substitution process. Furthermore, advertisements and product bonuses offered by pharmaceutical industry, patient's socio-economic factors also as credibility of manufacturers were factors reported to influence their selection of medicine.

Conclusion: Although it has emerged that students have widely accept the use of generic medicine, they still have concerns about the reliability and quality of such products. Students need to be educated and reassured about bio-equivalence, quality and safety of generic product approval system in Bangladesh. The current research has important implications for establishing generic medicine policies in Bangladesh.



CHAPTER I

INTRODUCTION

1. Introduction

One of the basic human needs is medicine [1]. So, every medicine needs to be safe, effective and have the least side effects [2]. But rising price of medicines have become a problem for many people. Although people in the developed country can afford the high price of medicine, but it becomes very difficult for the people of the Third-world-population Country. As the world's population grows, the demand for all resources is increasing, so is the demand for medicine. Where 50% of people are facing problems due to high prices [3]. In recent years, the use of generic drugs has been steadily increasing internationally as a result of economic pressures on drug budgets [4]. Governments and many organizations are working on it, So that medicine can be delivered to the people at low cost. In that case, generic medicines can work as an alternative. Generic medicine and generic alternatives are related to the tools by which healthcare costs can be reduced [5-8]. However, low awareness and reluctance among healthcare professionals towards generic drugs can negatively affect the rational use of generic alternatives [9]. A generic medicine is defined as a medication that is produced freely after the expiration of a patent to protect a branded product, necessarily similar to a reference drug in bio-equivalence to achieve the same therapeutic effect [10]. A generic drug consists the same active ingredient as the reference drug and is used to treat the same disease as the reference drug at the same dose. However, the name of the drug, its presence (such as colour or size) and its packaging may differ from the reference medicine [11]. However, the product agrees with all general requirements that the patent is off-patent, contains an active ingredient in a previously approved medicine, is shown as a bioequivalent with that approved medicine, and has the same dosage form, route of administration, and treatment characteristics.

1.1. *Bangladesh Pharmaceutical Industry and current generic production*

Pharmaceutical is one of the industries in Bangladesh that is moving forward with great potential. A large proportion of Bangladesh pharmaceutical market is dominated by domestic companies. The pharmaceutical industry in Bangladesh is one of the most developed technology sectors among the country. This sector provides 98% of the total medicinal requirement in the local market and also has well reputation to export other country [12]. Although the journey of Bangladesh pharmaceutical industry started in the early 50's. According to the Bangladesh Association of Pharmaceutical Industry, there are currently 269 small and large pharmaceutical factories in different parts of the country. Of these, about 164 factories are producing medicines regularly [13]. In the fiscal year 2019-20, the amount of export earnings in the pharmaceutical sector of Bangladesh was 136 million USD [14-15]. As well, Bangladesh ranks 71st position out of 134 countries in the world in terms of global pharmaceutical exports. At present 80% of pharmaceuticals in Bangladesh prepare generic medicine. After independence in 1971, Bangladesh, as a least developed country, was allowed to manufacture without patents in the pharmaceutical industry under the British Patents and Design Act 1911. As a result, production of generic medicine in the country began to increase. In 1995, Bangladesh signed a TRIPS agreement with the World Trade Organization (WTO),

which would allow Bangladesh to develop and market drugs without a patent as a least developed country, which would allow Bangladesh to produce drugs at lower prices [16-19]. Like was quite urgent for the underdeveloped health sector. Initially the term of the agreement was till 2005 but later the term of the agreement was extended till 2016. The agreement was later extended to 2033. This facility accelerates the growth of the country's pharmaceutical industry. At present, more than 450 generic medicines are prepared by the pharmaceuticals of the country. At present, the pharmaceutical industry of Bangladesh is trying to capture about 10% of the generic medicine market in the world market. In this journey, about 7 organizations of the country have already been able to get approval from top regulatory bodies like World Health Organization (WHO), World Trade Organization (WTO), and WIPO. As a least developed country, Bangladesh could produce pharmaceutical products in Bangladesh without a patent till 2033 as a result of TRIPS agreement with world trade organization. However, since Bangladesh will graduate from LDC by 2026, there is a possibility that Bangladesh will lose the benefit of manufacturing drugs without patent 7 years before the expiration date [20]. As a result, the production of many generic medicines is likely to stop.

1.2. Overview of Bangladesh medicine regulatory system

In Bangladesh, as in most countries, registration with the Directorate General of Drug Administration (DGDA) is required before a medicine preparation can be introduced into the market. The DGDA was established in 1976 under the Ministry of Health and Family Welfare as an individual department and it was upgraded on 17 January 2010. This DGDA supervises and apply all existing Drug laws within the country and regulates all activities associated with import, acquisition of raw and packing materials, manufacture and import of finished medication, export, sales, pricing, etc. of all kinds of medications including those of Homoeopathic, Ayurvedic, Herbal and Unani drugs and medicines [21-22].

In this time, under DGDA has 47 district offices in Bangladesh. All officers of the DGDA superintend as "Drug Inspector" in compatible to the Drug Laws and assist the Licensing Authority to discharging his responsibilities properly. As well, different Committees, such as Drug Control Committee (DCC), Standing Committee for imports of raw and finished goods, Pricing Committee and a number of other pertinent Committees, that construct of specialists of various fields, are there to recommendation Licensing Authority and suggest him concerning the matters associated with medicine and medicines [21]. To obtain a license, manufacturers must be in full compliance with the Good Manufacturing Practice (GMP) Code based on the World Health Organization Code. The products are also inspected regularly and surprisingly by DCA inspectors [23]. According to the policy of the medicine regulatory system of Bangladesh, in the case of marketing generic drugs, the drugs have to be approved and manufactured following the same rules as the brand-name medicine.

1.3. *Overview of Bangladesh healthcare system and public expenditure*

Bangladesh has a pluralistic healthcare system that is highly unregulated and has four main sectors which are: Government, private sector for profit, private sector for non-profit (mainly the nongovernmental organizations 'NGOs'), and international development organizations [24]. The public healthcare is under the Ministry of Health and Family Welfare. Among its departments are Health Services, Family Planning, Drug Administration, Nursing and Midwifery, Health Economics Unit, etc. [25] The public healthcare service consists of 4 levels: community level health service (community clinics and regional healthcare), Primary level health services (rural health centers, union subcenters, union family welfare centers and upazila health complexes), secondary level health services (district hospitals, general hospitals, thoracic clinics, tuberculosis clinics and leprosy hospitals), and tertiary health services (postgraduate medical institutes, specialized healthcare centers, medical college hospitals and infectious disease hospitals). The private sector additionally has health facilities starting from individual doctors' offices to high-end tertiary level international standard hospitals [25]. The public healthcare system is fully funded by the government and is mainly financed from income-tax, while private sector health spending is financed by out-of-pocket spending by people, private corporations, private health insurance and non-profit institutions.

Bangladesh has made significant progress in most of the health indicators, yet the country's health system is suffering badly due to the funding. The out-of-pocket expenses are increasing due to inadequacy and improper use of allocated funds. The National Health Policy has suggested a significant increase in the budget allocation for healthcare, however, in proportion to public expenditure, government health care expenditure has declined from 6.2% to 4.04% in the last eight years. Overall, 6% of healthcare costs are paid by people, whereas the global standard is below 32% [26]. The following table 1 shows the last 10 years of health expenditure of the Government of Bangladesh.

Table 1: The Bangladesh government health expenditure per capita

Year	Per Capita (US \$)	% of GDP
2018	\$42	2.34%
2017	\$37	2.28%
2016	\$35	2.31%
2015	\$33	2.46%
2014	\$30	2.50%
2013	\$27	2.50%
2012	\$23	2.57%
2011	\$23	2.57%
2010	\$21	2.50%
2009	\$18	2.40%
2008	\$16	2.35%

The per capita expenditure of the Government of Bangladesh on health is very low due to which the personal expenditure of the people is increasing. The rapid rise in healthcare spending has become a major concern for both the private and public perceptions. Healthcare spending is a big part of government budget and spending and this is the main problem that dominates health policy and its indicators. Thus, generic medicine provide an attractive alternative for cost- containment.

1.4. Rationale of study

In the context of Bangladesh health care system, wherever presently no separation of dispensing has been enforced, the GPs are important players within the medication distribution chain as their core activities revolve around prescribing still as dispensing of medicines. However, the public's perception of the use of generic medicine and the information on this regard is very limited. Since consumers have a very good option to reduce their healthcare costs by using generic medication, But to date no study has been done to understand and evaluate consumer perceptions of the safety, efficacy and quality of generic medicine. This study helps to understand and explore the undergraduate pharmacy students' knowledge, practices, perceptions and acceptance toward generic medicine.

CHAPTER 2

AIM AND OBJECTIVE

2. Aim and objective

Nowadays, generic medicine is tested expeditiously for bio-equivalency, in order that the medication reaching the patient ought to offer a similar therapeutic result because the original. Without bio-equivalency testing, however, it's unacceptable to substitute one drug with a purportedly equivalent one primarily based only on the similarity of ingredients. The USP standards should be additional correct regarding the wants for additives, as these additives will influence the efficacy of a drug. Most countries follow a policy of generic drugs that reduce costs without compromising health outcomes. One of the people's concerns is that health benefits are achieved through improved patient access without the need for additional health budgets. Because of the cheapness of the price, many have a fear that it will compromise its quality and effectiveness. So the question remains in the minds of the people about its acceptance. This study was done on the students to know their knowledge, attitude and perception about the use of generic medicine.

The specific objectives of this study are

- Exploring knowledge, attitude and perception about the use of generic medicine.
- To investigate the views of students on generic medicine practice.
- To know acceptance of generic medicine among the students.
- To explore misconception about the use on generic medication.



CHAPTER 3

METHODS

3. Methods

3.1. Study design and questionnaire validation

The sociological cross-sectional survey was conducted between March 2021 to May 2021. It was an online based survey. A draft questionnaire was developed after an extensive literature review focusing on people's general knowledge, attitudes and perceptions about generic medicine which are available from the university library and many national and international journal. Face and content validations of the initially developed questionnaire were done by the university professor of daffodil international university. An online form is then created with those questionnaire so that participants can give feedback via internet access.

The final set consists of 25 item of questionnaire and is segmented into 4 parts. The 1st part of the questionnaire was on respondent's demographic profiles. The 2nd part of the questionnaire was on exploring their knowledge of generic medication. The 3rd part of the questionnaire consist their perception on generic medicines utilization in Bangladesh and the final part consists of their remarks, about generic medications.

3.2. Inclusion and exclusion criteria

The inclusion criteria were that students must be undergraduate pharmacy students and be able to participate from the age of 16 and those who don't willing to participate voluntarily can exclude this survey.

3.3. Sample size and sampling strategy

Before start final sampling, a pilot study was conducted on 10 participants to check the error and ensure the questionnaire carried understandable, effective, efficient, reliable and valid data. Using convenience sampling methods, Students who are studying in Bachelor of Pharmacy at Daffodil International University were chosen as potential participants. Survey forms were distributed to the selected students and they are invited to fill out the form through online. For a period of 10 days, 100 respondents were consented and participated in the survey.

3.4. Statistical analysis

All the data were collected and entered into SPSS Version 26.0 for analysis. Using Fisher's exact test for group comparisons at a significance level of 0.05. Fisher's exact test was used because it's considered to be more appropriate for skewed data, as were obtained in this study.

CHAPTER 4

RESULTS

4. Results

4.1. Demographic characteristics of students

Invitations were sent to more than 150 students, of whom 100 responded. All of them were students of the pharmacy department of Daffodil International University. Majority of the respondents were male (55%) with 5.5% 1st year, 14.5% 2nd year, 30.9% 3rd year and 49.1% 4th year students, and 45% were female of which 7.3% were 2nd year, 14.5% were 3rd year and 60% were 4th year students. There was no female response from the 1st year.

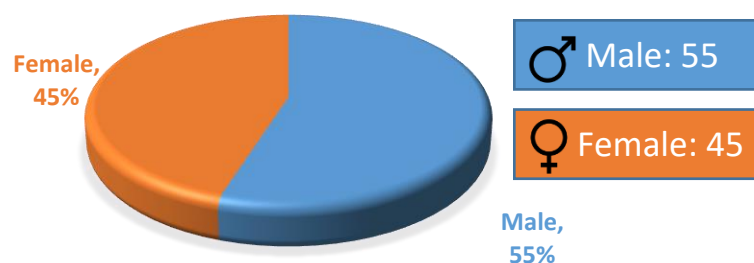


Chart 1: Percentage of male & female participant

A cross-sectional analysis of undergraduate pharmacy students' knowledge and attitudes about the use of generic medications

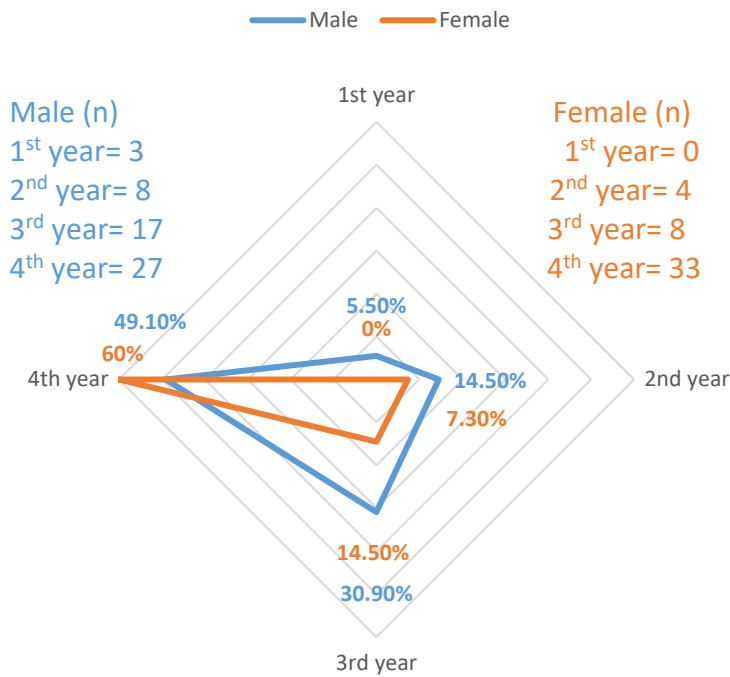


Chart 2: According to study level male and female Participation

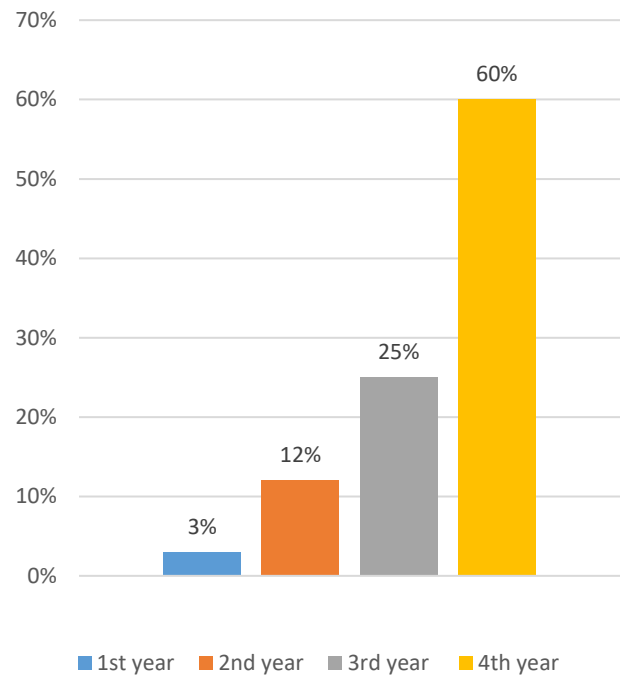


Chart 3: Participant percentage of study level

Among the overall respondents, 10% were 1st year, 10% 2nd year, 10% 3rd year and 10% 4th year students. The age distributions, Religion, Marital status and other demographic profile of respondents are respectively shown in table 2.

Table 2: Demographic characteristic of Student.

Characteristic	Response rate <i>n</i> (%)	SD
Gender		
Male	55 (55%)	0.500
Female	45 (45%)	
Age (years)		
16-20	5 (5%)	0.243
21-25	94 (94%)	
26-30	1 (1%)	
Above 30 years	0 (0%)	
Level of study		
1 st year	3 (3%)	0.819
2 nd year	12 (12%)	
3 rd year	25 (25%)	
4 th year	60 (60%)	
Marital status		
Married	7 (7%)	0.376
Unmarried	89 (89%)	
In a relationship	3 (3%)	
Divorced	1 (1%)	
Religion		
Muslims	87 (87%)	0.514
Sanatan dharma	11 (11%)	
Buddists	0 (0%)	
Other	2 (2%)	

4.2. Student's knowledge of generic medication.

Majority of the students (93%) are known about the generic medication, the study found that some students (4%) were a little hesitant to know about generic medicine, and 3% said they did not know at all, there was a significant association between this question and respondents' study level ($p=0.002$, Std. Dev= 0.424).

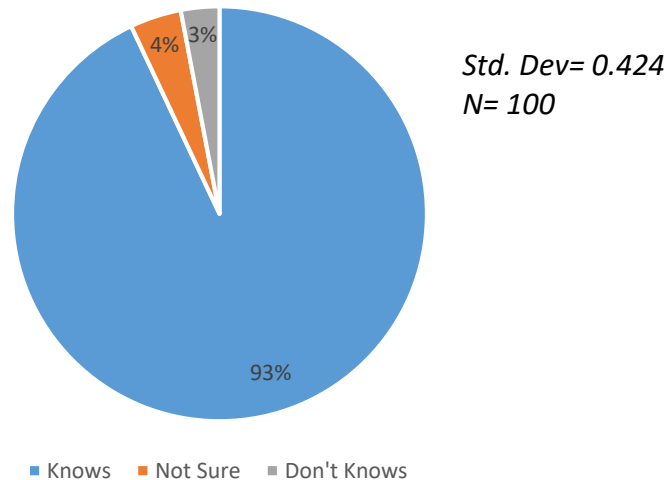


Chart 4: Students known about the generic medication

And when asked where they first got the information about generic medicine, they said the names of the different sources which are shown in the graph below.

A cross-sectional analysis of undergraduate pharmacy students' knowledge and attitudes about the use of generic medications

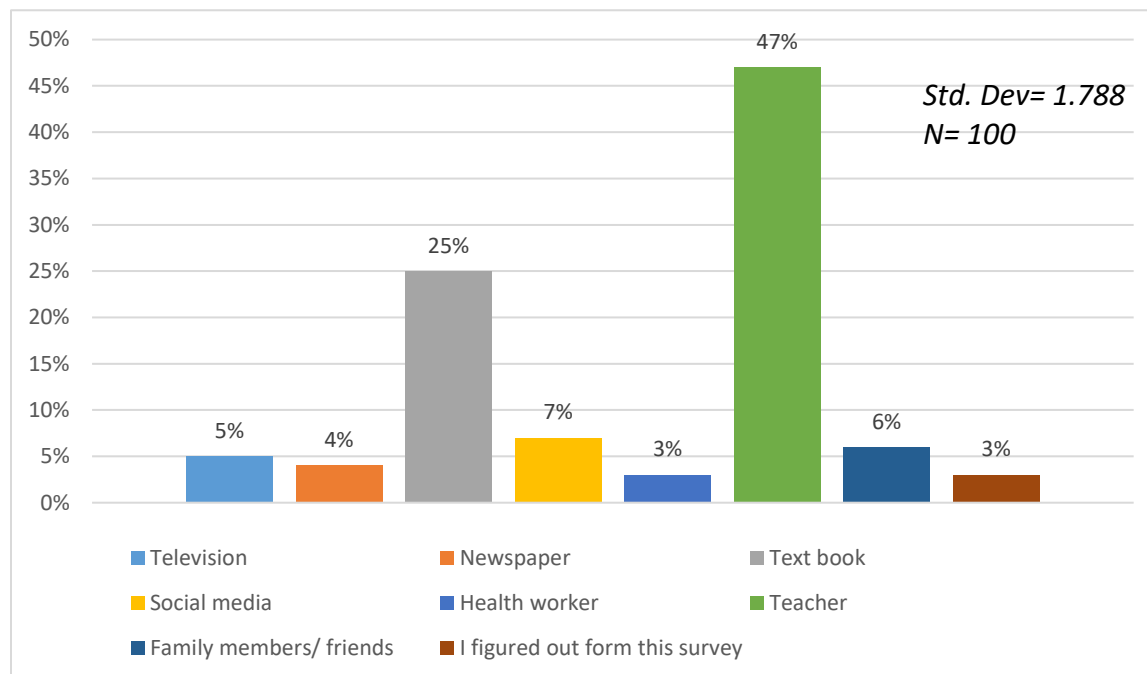


Chart 5: *The first source of information for students about generic medicine*

The knowledge-based part of this study had questions about bioequivalence, dosage form, dosage type, quality, effectiveness and side effects of the drug. The study found that students had a good idea about generic medicine and answered most of the questions correctly. Table 3 further explains the general knowledge of students about the generic medication. According to the FDA's policy, generic medicines must be equally bioequivalent as brand-name medicine. The study found that, as noted in Table 3, a total of 76% of participants agreed that generic medicine was as bioequivalent as brand-name medicine. Although the effectiveness of the drug and its side effects depend on different factors (Type and quantity of raw material used, the method of development, person tolerance capacity, gender, size and amount of muscle, use of other drugs, etc.) In that case, the issues do not depend on brand-name medicine or generic medicine. Participant gives mixed reaction about quality and side effect, majority of participants (53%) disagreed that "generic medicine is less effective", 29% agreed and 18% were neutral with that statement. But 48% of participants felt that brand-name medicines meet higher quality requirements than generic medicines where 23% disagreed and 29% were neutral. In terms of side effects, 52% disagreed that generic medicine showed more side effects than brand-name medicine and 28% thought that generic medicine showed more side effects than brand-name medicine and 20% of participants were neutral.

Table 3: Student's knowledge of generic medication.

Variable	n (%)					SD	p Value (with gender)
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree		
1. Generic medications are bioequivalent to brand-name medicines.	22 (22%)	54 (54%)	15 (15%)	7 (7%)	2 (2%)	0.906	0.684
2. Generic medications must be available in the same dosage type (e.g. tablet, capsule) as brand-name medicines.	27 (27%)	50 (50%)	16 (16%)	5 (5%)	2 (2%)	0.903	0.245
3. The dosage of a generic drug must be the same as that of a brand-name medicine.	25 (25%)	44 (44%)	21 (21%)	8 (8%)	2 (2%)	0.968	0.020
4. Generic medications are less effective than brand-name medicines.	8 (8%)	21 (21%)	18 (18%)	37 (37%)	16 (16%)	1.205	0.667
5. Generic medicines have more side effects than brand-name medicines.	7 (7%)	21 (21%)	20 (20%)	35 (35%)	17 (17%)	1.191	0.430
6. Brand-name medicines must meet higher quality requirements than generic medicines.	12 (12%)	36 (36%)	29 (29%)	17 (17%)	6 (6%)	1.080	0.191

79% believed that the dosage of a generic drug must be the same as that of a brand-name medicine, there was a significant association between this question and respondents' study level and gender ($p=0.025$, $p=0.020$).

4.3. *Student's perception on generic medicines utilization in Bangladesh*

Table 4 shows the responses of students on various statements regarding generic medicine utilization in Bangladesh. Approximately 71% of the students in this survey believed that a standard guideline is required for both GPs and pharmacists on brand substitution process. Of these, 74% of students thought that the quality use of generic medicine among Bangladeshi consumers can be achieved if health professionals work together. The majority of the students (84%) also agreed that patients should be equipped with adequate information on generic medications in order to make sure they understand about the medications they are taking, There was a significant association between this question and respondents' gender ($p=0.006$). Students were also asked to indicate their responses on factors affecting about doctors' prescribing tendencies. About 76% of the students agreed that advertisements by drug companies played a role in doctors' prescribing pattern. The majority of the respondents also indicated that information on the patient's socio-economic factors (66%) as well as credibility of manufacturers/supplier (54%) were important considerations when prescribing. Approximately 74% of the respondents agreed with that product bonuses offered by pharmaceutical companies will influence doctors' choice of medicine, There was a significant association between this question and respondents' study level and gender ($p=0.016$, $p=0.030$).

Table 4: Student's perception on generic medicines utilization in Bangladesh.

Variable	n (%)					SD	p Value (with gender)
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree		
1. I believe that a standard guidance for both GPs and pharmacists on the brand substitution process is needed.	20 (20%)	51 (51%)	26 (26%)	3 (3%)	0 (0%)	0.756	0.089
2. Quality use of generic medicines among Bangladeshi consumers, in my view, is possible if health professionals collaborate.	17 (17%)	57 (57%)	23 (23%)	2 (2%)	1 (1%)	0.747	0.065
3. I believe that patients should be given enough information about generic medicines in order to ensure that they really understand the medicines they are taking.	34 (34%)	50 (50%)	13 (13%)	3 (3%)	0 (0%)	0.757	0.006
4. I believe that drug company advertisements can affect doctors' medical practices.	20 (20%)	56 (56%)	17 (17%)	6 (6%)	1 (1%)	0.832	0.194
5. The socioeconomic status of the patient would have an effect on the brand prescribing procedure.	21 (21%)	45 (45%)	25 (25%)	8 (8%)	1 (1%)	0.908	0.887
6. Doctors are concerned about the credibility of manufacturers/suppliers when prescribing medications.	12 (12%)	42 (42%)	31 (31%)	13 (13%)	2 (2%)	0.944	0.593
7. Product benefits or gifts from pharmaceutical firms will affect doctors' medication selection.	30 (30%)	44 (44%)	19 (19%)	6 (6%)	1 (1%)	0.909	0.030

4.4. Student remarks about generic medications

The study explores participants' knowledge as well as their personal opinions on generic medicine. Majority of them (85%) were interested in learning more about the safety and efficacy of generic medicine, There was a significant association between this question and respondents' study level and gender ($p=0.001$, $p=0.005$). 45% of respondents think that generic medicine will help break the nexus between the pharmaceutical industry and doctors and 80% of respondents support the introduction of generic medicine in Bangladesh.

Table 5: Student remarks about generic medications.

Variable	<i>n (%)</i>					SD	<i>p</i> Value (with gender)
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree		
1. I'd like to learn more about the safety and effectiveness of generic medications.	41 (41%)	44 (44%)	12 (12%)	(%3) 3	0 (0%)	0.777	0.005
2. Generic medicine breaks the nexus between the pharmaceutical industry and the physicians.	13 (13%)	32 (32%)	33 (33%)	19 (19%)	3 (3%)	1.025	0.124
3. How strongly do you support the introduction of generic medicines in Bangladesh?	32 (32%)	48 (48%)	17 (17%)	2 (2%)	1 (1%)	0.213	0.114



CHAPTER 5

DISCUSSIONS

5. Discussions

A response rate of about 66.66% was achieved in this study after contact attempts with the students by mail and different online messaging service. And response taking is stopped when 100 targets is met. This study places more emphasis on the response of students in the department of Pharmacy than on the response of students from other department. Most students participate in this study with sincerity. The majority of students in this survey indicated a high generic prescribing rate. They also give response about brand-name medicine, why doctors prescribe brand-name medicine more and they were given a few options in this regard, they expressed their opinion based on it

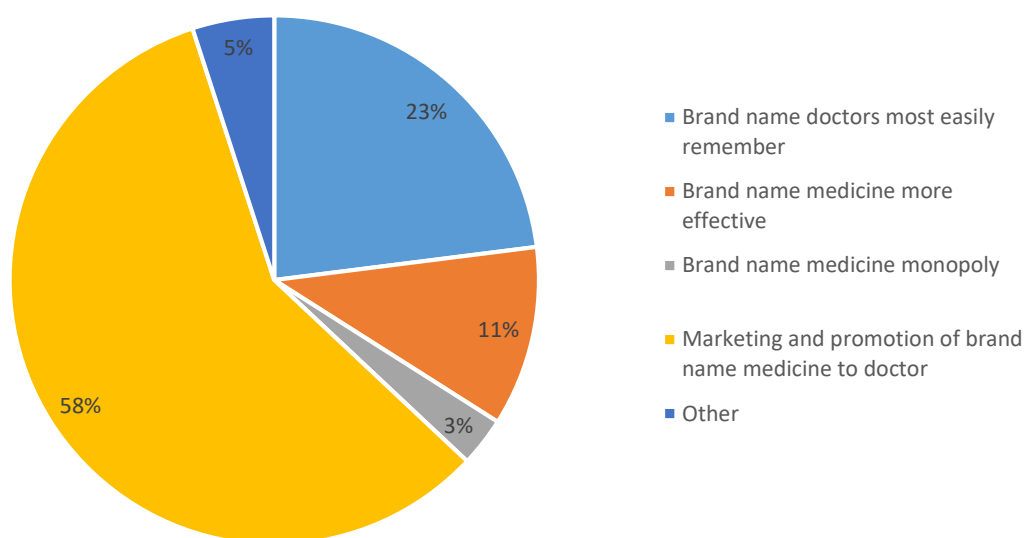


Chart 6: Reason to doctors prescribe brand-name medicine more basis on student's opinion

The majority of students think that doctors prescribe more brand name medicine because of marketing and promotion of pharmaceutical companies. The present scenario also shows that pharmaceutical companies market their products in large quantities to different doctors. Since the more doctors prescribe their company's product, the more their product will be sold and profit will be made. So, in order to prescribe the product of their company, they have been doing their job by showing different gifts and temptations to the doctors.

There was a misconception among respondents about the concepts of "efficacy", "safety", "bio-equivalence", and "manufacturing standards" of generic medications, as shown in Table 3 76% believed that generic medications are bioequivalent to brand-name medicines. One the other hand 29% said that generic medications are less effective than brand-name medicines. Lack of

knowledge about the regulatory requirements of generic drugs can have a negative impact on the confidence of generic drugs and ultimately the future of generic prescribing. In Ireland, there was a relatively low rate of generic prescription compared to England and Northern Ireland due to the initial concerns of Irish presidents about the reliability and quality of generic drugs [27].

The students in this study agreed that it is important to establish collaboration between GPs and pharmacists to improve the use of generic drugs by the general public. Indeed, misconceptions about generic medications need to be corrected in order to promote expensive prescriptions. The study further showed that negative perceptions of generic drugs among Bangladeshi students can be attributed to lack of knowledge about generic drugs. Thus, extensive educational efforts and better communication between patients and healthcare professionals could potentially stimulate the adoption of generic drugs among consumers. Educational interventions on generic drugs in Spain have been shown to increase generic acceptance among patients, and generic prescriptions have increased by 5.9% in groups receiving educational basic interventions, compared with 2.8% in the control group [28]. Patient acceptance can encourage practitioners' motivation, behaviour, and knowledge of generic forms. In Australia, confusion among patients due to different brands of the same drug was a limited reason for prescribing generic drugs among GPs [29]. Various measures can be taken to reduce confusion and improve patient acceptance of the generic product. The UK Medicine and Healthcare Product Regulatory Agency (MHRA) recommends that drug labelling should be based on the International Non-Owned Name (INN) because it helps patients identify their medication and reduces confusion when brand options appear [30]. This strict labelling requirement is a classic example of Bangladeshi imitation. Also, patients should be informed about the reasons behind the replacement and assured about the quality of the generic products and the equivalence of treatment. The success of generic replacement is actually the result of interaction and active communication between physicians, pharmacists and patients.

Medications represent a special reasonable merchandise whereby there are usually three players consisting of customers, pharmacists, and physicians. Price or cost of generic medicines is clearly important; since price is that the reason generic medications are considered within the initial place [31]. However, consumers do not directly judge the suitability of their drugs. The physician acts as the purchasing agent in selecting the most appropriate medication for the patient [32]. In this study, we tried to explore pharmacy students' knowledge and understanding about generic medications. Needless to say, this study was not conducted on the general population of Bangladesh. There were some who knew little about generic medicine. There can be many reasons for being less familiar with generic drugs; one of these is the lack of communication between healthcare professionals and patient-consumers. But the findings from this study showed that Bangladeshi students have a fairly good knowledge about generic drugs. In the first question of the knowledge section they are asked if they know about generic medicine, to which about 93% answer that they know about generic medicine whose data is shown in chart 4 and by checking the rest of the questions in the knowledge section it is

understood that They are well versed in generic medicine, the questions shown in Table 3. This study shows that students' main sources of information about their medicines come from teacher and text book, which is clearly understood through chart 5. But it also shows the inadequate use of the media and health workers to educate the public. Therefore, if the use of generic drugs needs to be increased from the current situation in the future, it is important for the government, health agencies and healthcare providers to pay more attention to using these resources more efficiently.

With regards to lower confidence among customers on the problem's close quality, effectiveness, safety, and side effects of a generic drug, several stakeholders within the quality use of medicines framework have to be compelled to persuade the customers that both generic and brand name medicines have to be compelled to fulfil an equivalent safety and effectiveness criteria before it can be marketed. But there are still reactions and endless doubts. First, it may stem from their previous experience using generic medications. Second, this attitude may arise because of their mentality which emphasizes that branded drugs are always good. Third, another reason that could lead to this scenario is the lack of advice from health professionals. Last but not least is that there is a psychological complex that both reactionary and health professionals believe that medicines made in Western countries are always better than medicines made locally or regionally. All of these factors contribute to and greatly affect patients' estimation and acceptability. Governments are currently putting enough emphasis on their potential economic benefits associated with the use of generic drugs. Together, there is growing discussion in the media about perceived doubts about the quality and equivalence of generic drugs [33].

The present study additionally has a number of its own limitations. The primary limitation is small sample size of respondents were utilized in order to elicit their responses towards issue relating generics. The size of this small sample may affect the generalization of this study to the larger population of Bangladesh. In addition, the use of convenient sampling techniques may result in some reaction bias among participants. It was recommended that a large population-based survey be conducted to generalize the findings of the current study of the larger population.

CHAPTER 6

CONCLUSIONS

6. Conclusions

Students are fairly knowledgeable about generic medicine, and this study demonstrates that while students are knowledgeable about the concept of generic drugs, they are concerned about the dependability and quality of generic products. Students must be educated and reassured about the bioequivalence, quality, and safety of Bangladesh's generic product approval system. The current study has important implications for developing generic medicine policies in Bangladesh.

CHAPTER 7

REFERENCES

7. References

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