

“An Overview of Prescription Pattern of Antibiotic among the Different Specialist Doctors in Faridpur City”



SUBMITTED BY
MD SAIFUL ISLAM
ID NO: 171-46-144

DEPARTMENT OF PHARMACY
FACULTY OF ALLIED HEALTH SCIENCE
DAFFODIL INTERNATIONAL UNIVERSITY
SOBHANBAGH, DHAKA

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A DISSERTATION SUBMITTED TO THE DEPARTMENT OF PHARMACY,
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THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PHARMACY.

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APPROVAL

This is certify that this project report, entitled “**An Overview of Prescription Pattern of Antibiotic among the Different Specialist Doctors in Faridpur City**” submitted by MD. SAIFUL ISLAM to the Department of Pharmacy, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Master of Pharmacy is authentic record of original research work was carried out by MD. SAIFUL ISLAM, ID 171-46-144 and approved as to its style and contents.

Md Mizanur Rahman

Adjunct Faculty

Department of Pharmacy

Faculty of Allied Health Science

Daffodil International University

BOARD OF EXAMINERS

Dean

Professor Dr. Ahmad Ismail Mustafa
Dean
Department of Pharmacy
Faculty of Allied Health Science
Daffodil International University

Head

Md. Mustafezur Rahman
Head
Department of Pharmacy
Faculty of Allied Health Science
Daffodil International University

Internal Examiner

Internal Examiner

External Examiner

DECLARATION

Myself, MD. SAIFUL ISLAM, ID 171-46-144, M.Pharm of Department of Pharmacy, Faculty of Allied Health Science, Daffodil International University do here by declared that the project report entitled **“An Overview of Prescription Pattern of Antibiotic among the Different Specialist Doctors in Faridpur City”** submitted by me to the Department of Pharmacy, Daffodil International University in the partial fulfillment of the requirement for the degree of Master of Pharmacy is a genuine and authentic record of original research work carried out by me under the supervision and guidance of MD. MIZANUR RAHMAN, Adjunct Faculty, Department of Pharmacy, Daffodil International University and it has not formed the basis for the any other Degree/ Diploma or other similar title to any candidate of any other academic award anywhere before.

Md. Saiful Islam

ID: 171-46-144

Batch: 4th M.Pharm

Department of Pharmacy

Faculty of Allied Health Science

Daffodil International University

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DEDICATION

To

Almighty Allah & My Family

For their abundant support, for their patience and understanding and for their love

To

My Supervisor

Mizanur Rahman

Adjunct Faculty

Department of Pharmacy

Faculty of Allied Health Science

Daffodil International University

For his valuable time, advice and support and he have given me in the writing of this report.

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ABSTRACT

An overview of prescribing pattern of antibiotics medication was completed for a period of up to 3 months in the territory of Faridpur city. The aims and objectives of this study were to observe the current pattern of antibiotics prescription, most prescribed antibiotics and find out the brand leader of antibiotics so that we can gain a better understanding of prescription pattern of antibiotics and the usage of these agents in different types of patients with different types of diseases that why the data was obtained from patients visiting in different private hospital and public hospital in Faridpur city.

During the study period a total of 250 prescriptions were analyzed and out of 250 patients, 157 (62.80%) were male and 93 (37.20%) were female (including children and adults) where most of the patients were outpatients 228 (91.20%). From 250 prescriptions found that 1036 individual drugs were prescribed (an average of 4.14) and 124 prescriptions (49.60%) were prescribed the total four (4) drugs was found to be highest among 250 prescriptions.

I found that the antibiotic containing prescription 184 that was 73.60% from total prescription and almost all prescription (100%) contained antibiotic drugs along with other group of drugs. From 250 prescriptions found that the four most commonly prescribed group of drugs were antiulcerants 197 (78.80%), NSAIDs 118 (47.20%), vitamin and minerals 96 (38.40%) and antihistamines 42 (16.80%).

From this analysis I found that 41.85% prescription contained single antibiotic drug, 58.15% contained two antibiotic drugs and no prescription contained more than two antibiotic drugs in which maximum drugs (93.13%) were prescribed by their brand names.

This study observed that percentages of different generic of antibiotics are Cefuroxime 23.02% is the highest area, and then prescribed commonly Cefixime 17.87%, Ciprofloxacin 16.49%, Levofloxacin 11.68%, Flucloxacillin 9.62%, Amoxicillin 7.90%, Cefpodoxime 2.75%, Cephadrine 2.40% and others generic of antibiotics 8.25%.

From the study I found that the percentage of the share of antibiotics among the different pharmaceutical company included Oponinpharma Ltd 24.74% is the highest, Square pharmaceutical limited 19.24%, Popular pharmaceutical Ltd 18.21%, Beximco pharmaceutical limited 12.71%, Incepta pharmaceutical limited 8.59%, and the rest 16.50% antibiotics prescribed form others pharmaceutical company.

CHAPTER #1
INTRODUCTION

1. INTRODUCTION

For a long time it has been stated and restated that the prescription department is the heart of the medication store. This is true but it is not only the heart of the medication store; it is also the backbone of retail pharmacy ^[1]. Drugs are the basic tool for preventive, curative and rehabilitative health care. Although the number and type of drugs is constantly increasing, while the financial resources for health care services in general, remain limited ^[2].

Knowledge of risk perceptions has demonstrated to be vitally important in understanding how individuals and societies manage the risks of daily life. In medicine perceptions of drug risks are probably to influence patients' treatment decisions, their compliance with treatment regimens, their views on the acceptability of adverse reactions and the drugs that cause them, and their attitudes toward government regulation of medications. Understanding perceptions is a prerequisite for designing better communication materials for patients and the general population ^[3]. The drug use process can be separated into four fundamental components, namely: prescribing, dispensing, administration/ uptake and outcome (efficacy/safety) ^[4].

The evaluation of medication use is vital for clinical, educational and economic purposes ^[5]. Monitoring of prescriptions and drug utilization study could distinguish the related problems and give feed backs to the prescriber in order to make awareness for the rational use of drugs ^[6]. It is therefore necessary to define the prescribing pattern and target the irrational prescribing habit for sending a remedial message ^[7].

1.1 Health Care System in Bangladesh

The ministry of health and family planning controlled the health care system in Bangladesh. The legislature is in charge of building wellbeing offices in rural and urban territories. For instance, in the late 1980's in Bangladesh, the provincial wellbeing offices that existed in the rural territories were for the most part sub-area wellbeing focuses, provincial dispensaries and family welfare focuses. Sadly, they were ineffectively administered (WHO, 2010) ^[8].

In Bangladesh, most of the nation's populace lives in rural zones, while the lion's share of wellbeing experts work in urban focuses. Likewise, the fast development of the private medicinal framework implied that fewer experts stayed in general society division to deal with the majority. Private frameworks are generally distant for destitute individuals who can scarcely bear to live step by step.

The wellbeing framework in Bangladesh is supply-side financed, implying that poor family units can have access to therapeutic medications or if nothing else to basic medicinal care. All things considered, there is a vast hole since network financing programs are absent.

Some NGO's have begun to offer small scale credit restorative projects keeping in mind the end goal to help build up a national protection program. 33% of the national wellbeing framework is freely financed, implying that the administration pays for it from duties and universal sponsorships. This implies poor people populace is compelled to pay for medicinal costs while they can scarcely bear to put bread on the table due to the massive absence of occupations (WHO, 2010).

1.2 Disease Pattern in Bangladesh

The growth rates in Bangladesh are one of the highest rates in the world. For the reason of patriarchal issues in our country's society fertility rate is extremely high because patriarchal issues request women to bear children and work in rural, menial jobs. On the other hand Bangladesh's population is limited in urban centers although highly in rural. For the infectious diseases like typhoid fever, UTI's diarrhea, respiratory diseases, and hepatitis A & E, it also has a high risk. The main reason for this is our extremely poor country health system and under developed. Most of the woman spent their entire lives without making contact with a medical professional while some of them don't receive medical treatment.

Health problems abound, springing from poor water quality and prevalence of infectious diseases. Common diseases such as Malaria and dengue were rampant in Bangladesh.

Malnutrition in Bangladesh has been a persistent problem for the poverty-stricken country. The World Bank estimates that Bangladesh is ranked 1st in the world of the number of children suffering from malnutrition. In Bangladesh 26% of the population are under nourished and & 46% of the suffers from moderate to severe under weight problem. 43% of children under 5 years old are stunted. One in five preschool age children are vitamin A deficient and one in two are anemic.

More than 45% of rural families and 76% of urban families were below the acceptable caloric intake level. According to the World Bank, about one -third of babies in Bangladesh are born with low birth weight, increasing infant mortality rate and leads to increasing risk of diabetes and heart ailments in adulthood. According to UNICEF, one neonate dies in Bangladesh every three to four minutes, 120000 neonates die every year.

1.3 Prescription pattern in Bangladesh

Prescribing is a complex assignment requiring diagnostic skills, communication skills, information of medicines, an understanding of the principles of clinical pharmacology, appreciation of risk and uncertainty. So prescription writing is a science and art, as it passes on the message from the prescriber to the patient. Prescribers can just treat patients in a rational way if they have access to a basic medications list and that drugs are available on a regular basis ^[9].

The total number of registered physicians in Bangladesh is 44225, thus making one physician for every 3278 people (WHO, 2011). So for each 10,000 population, have 3.05 physicians and 1.07 nurses for 10,000 populations and 0.39 physicians/1,000 population in 2012 ^[10].

Finally Physicians per 1,000 people in Bangladesh was reported at 0.472 in 2015, according to the World Bank collection of development indicators, compiled from officially recognized sources.

Without enough qualified specialists, drugs are often prescribed by unqualified health workers and every people can get any medication from any drug store without a prescription. Every day new medications with higher cost are coming into market in large scale. Family people need to spend huge money for purchasing drugs.

For instance, Bangladesh burned through 5,500 cores in health only in the year 1996-1997, out of which add up to spending on drugs was TK 2,700 cores. But it was discovered that the family/individuals needed to spend TK 2500 cores which are around 90.7% of aggregate spending on drugs. Government and different sources spent just TK 250 cores for drugs ^[11]. Therapeutically inappropriate and economically inefficient use of medicines is watched all through the Bangladesh. It

has a extreme lack of HR for health and a workforce far below the threshold value of 22.8 per 10,000 population estimated by world health organization (WHO) as necessary for meeting the health related millennium development goals.

Given the shortage of qualified health work force in Bangladesh and the inequity of their distribution, People prefer to seek health care from non-qualified providers in the informal sector, especially the poor and the disadvantaged. Lack of facilities, lack of doctors and lack of medications, moreover lack of appropriate knowledge of both doctors and patients are leading health of rural patients in great risk. Deficient supply of fundamental medications, substandard quality, and uncontrolled medication costs and improper uses of drugs are significant issues in Bangladesh ^[11]

1.4 Standard prescribing indicators

To assess the patterns of prescribing in health facilities, standardized prescribing pointers have outlined by the World health organization (WHO). These include –

- The quantity of medications per encounter
- The percentage (%) of drugs prescribed by brand name
- The percentage (%) of antibiotics and injectable drugs per encounter and
- The percentage (%) of medications recommended from an essential drug list (EDL)

These markers are utilized to portray current treatment rehearses, think about health facilities and prescribers, and take into consideration of potential drug-use problems that may affect patient care. The WHO recommended value of the number of medicines ranges from 1.4 to 1.8 per prescription, injectable medicines 13.4% - 24.1%, antibiotics prescription 20% - 27% and whereas standard accepted value for prescribing by generic name and from EDL is 100%. Drug-prescribing patterns in health institutions can be evaluated by based on these recommended

values. Hence, to achieve rational and cost-effective medication use, based on an evaluation, the necessary modification to the pattern may be suggested. For drug prescribing pattern study in health facilities a minimum of six hundreds (600) patient records can be evaluated retrospectively [12].

1.5 Rational use of drugs

The rational use of drugs is characterize as “Patients gets medicines proper to their clinical needs, in doses that meet their own specific individual prerequisites, for a satisfactory time frame, and at the most minimal cost to them and their community” [13].

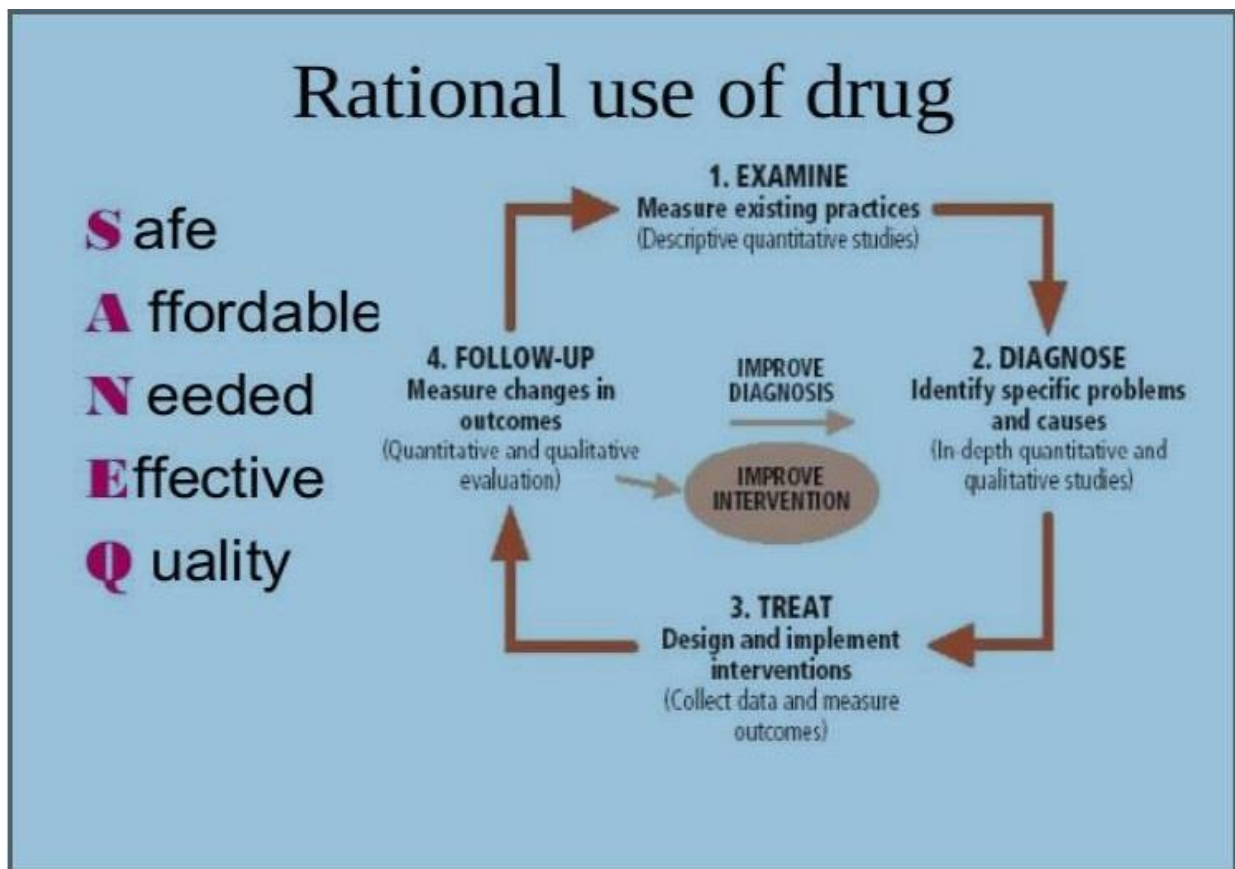


Figure 1: Rational use of drug (Juxtaglomerular, 2014)

1.6 Irrational use of drugs

Irrational or non-rational utilize is the utilization of medicines in a way that isn't consistent with rational use as define above. Worldwide more than 50% of all medicines are prescribed, dispensed, or sold inappropriately, while 50% of patients fail to take them correctly ^[13].

Irrational use of drugs may lead to:-

1. Ineffective & unsafe treatment
2. Exacerbation or prolongation of illness.
3. Distress & harm to patient
4. Increase the cost of treatment ^[14].

1.6.1 Impact of Irrational use of Drugs

Impact of inappropriate use of drugs can leads some problems. Such as:

- 1) Reduction in the quality of drug therapy leading to increased morbidity and mortality.
- 2) Waste of resources leading to reduced availability of other vital drugs and increased costs.
- 3) Increased risk of unwanted effects such as adverse drug reactions and the emergence of drug resistance
- 4) Psychosocial impact which may cause an apparent increased demand for unnecessary drugs.

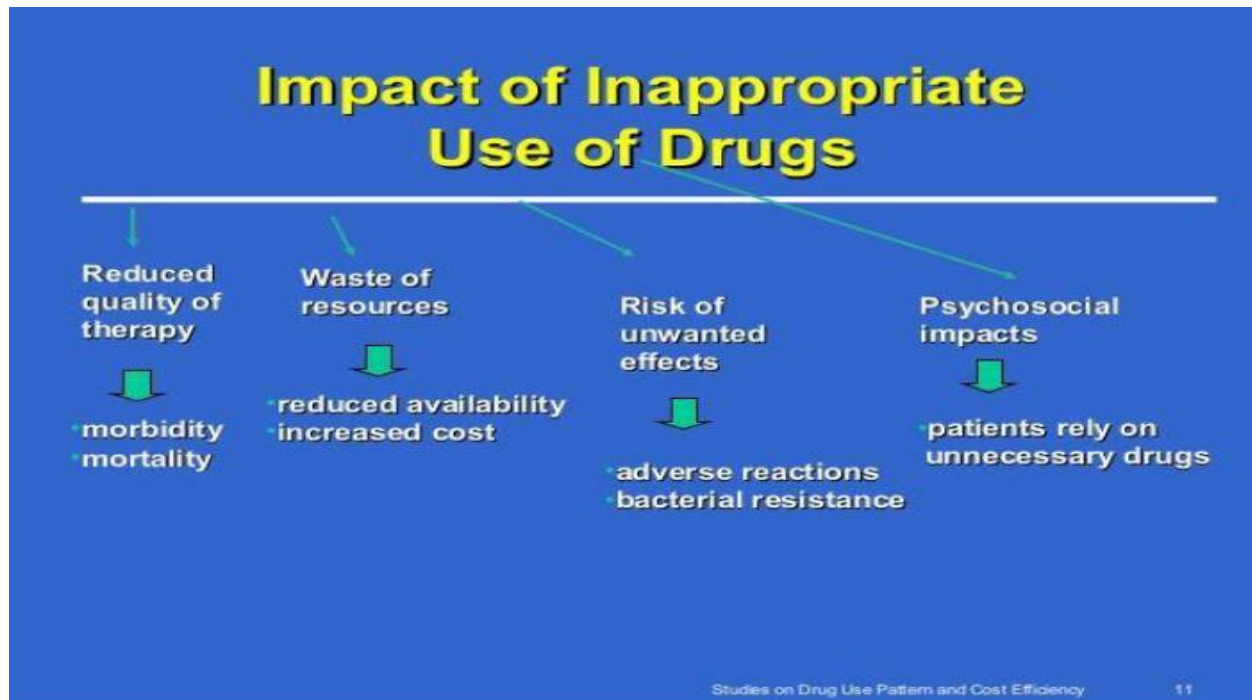


Figure 2: Impact of inappropriate use of drugs [15]

1.6.2 Reasons for irrational use of drug

1. Lack of information –

We don't have regular facility unlike many developed countries that can provide unbiased information up to date on the currently used drugs. Also many of our practitioners depend on medical representatives in many cases. There are differences between the drug regulatory authorities and pharmaceutical concern in the interpretation of the data related to safety and indications of drugs.

2. Poor conversation between patient & health professional –

This includes most health professionals and medical practitioners don't give more time to the patient and about the use of drugs they don't share some basic information.

3. Faulty and inadequate education and training of medical graduates –

During training period writing a prescription dependency on diagnostic aid, rather than clinical diagnosis is increasing day by day, due to lack of proper clinical training.

4. Lack of diagnostic facilities –

In case of rational drug therapy correct diagnosis is an important step. Due to no availability of diagnostic facilities have to face a lot of difficulty in reaching to a precise diagnosis where doctors posted in remote areas that promotes poly-pharmacy.

5. Patient demand –

Patient expectations and demand of quick relief that satisfy the patient, clinician prescribe drug for every single complaint. Also, there is a belief that “every ill has a pill” All these increase the tendency of poly-pharmacy.

6. Defective drug supply system and ineffective drug regulation –

Irrational use of drugs occurs due to the presence of large number of drugs in the market and absence of well-organized drug regulatory authority.

7. Pharmaceutical promotional activities –

Various pharmaceutical industries influence the drug prescribing due to the lucrative promotional programs ^[16].

1.6.3 Patients and community level irrational use of drugs –

The ultimate users of drugs are patients and only they can make the final decision about where to seek health care, whether or not to seek it, and also about what medicines to actually take, what intervals and duration. For this reason correct prescribing does not guarantee that drugs will be properly used in all cases ^[33].

The patient decisions are influenced by many factors including, the communication skills and attitudes of health workers, cultural beliefs, accessibility to and nature of the health service delivery point, routes of administration and the patient's assessment of a particular disease, community belief about the efficacy of certain drugs.

The fear of the illness lead patients to the demand for inappropriate treatment because, patients' do not have the information to make appropriate judgment of their drugs they require. There is a pill for every ill is a concept that has resulted into patients' over reliance on drugs, becoming accustomed to using particular drugs and dosage forms. Example include, using of antibiotics in the treatment of the common cold or in conditions where oral dosage forms would be more appropriate but using injectable dosage form.

The community where the availability of drugs and has allowed unlimited access to patient of all classes of drugs. The WHO reports indicate that many sources present where prescription drugs are widely available which include traditional healers, street peddlers and unlicensed stores in most of the developing countries (WHO, 1997).

Due to lack of state regulatory enforcement capacity, prescription-only drugs are also widely available direct to consumers even from licensed pharmacies. Between over the counter (OTC) and prescription only medicine does not differentiate by the drugs consumers and sellers. Lead to patients to resort any form of health care available in the community due to the lack of access to health facilities that result self-medication. The areas that are less covered by public health unit, irrational drug use is more prevalent than those areas that are covered by public health unit (WHO, 1997).

1.7 Antibiotics

Definition

Antibiotics are a group of drugs that are used to treat diseases caused by germs (microscopic organisms like bacteria and certain parasites). A parasite is a sort of germ that requires to live on or in another living being (host). Antibiotics are sometimes called antibacterial or antimicrobials. Antibiotics can be taken by mouth as tablets, liquids, or capsules or they can be given by injection. As a rule, individuals who need to have an antibiotic by injection are in hospital because they have a severe infection. Antibiotics are also available as ointments, lotions, or creams to apply to the skin to treat certain skin infections. Remember that antibiotics just work against infections that are caused by microscopic organisms like bacteria and certain parasites. They don't work against infections that are caused by viruses (such as flu, the common cold etc.), or fungi (like thrush in the mouth or vagina), or fungal infections of the skin. Incidentally, a viral infection or minor bacterial infection forms into a more serious secondary bacterial infection. This is why different antibiotics are used to treat different types of infection ^[17]. The main types of antibiotics include:

- ✚ Cephalosporins: – Such as cefalexin, cefadroxil and cefaclor.
- ✚ Penicillins: – Example include amoxicillin, flucloxacillin etc.
- ✚ Tetracyclines: – Example include tetracycline, lymecycline and doxycycline.
- ✚ Aminoglycosides: - Example, tobramycin, gentamicin.
- ✚ Macrolides: - Example, azithromycin, erythromycin and clarithromycin.
- ✚ Quinolones: - e.g. ciprofloxacin, levofloxacin
- ✚ Sulfonamides and trimethoprim: - e.g. co-trimoxazole.
- ✚ Clindamycin.
- ✚ Metronidazole and tinidazole. ^[17]

1.7.1 Mechanism of action of different antibiotics

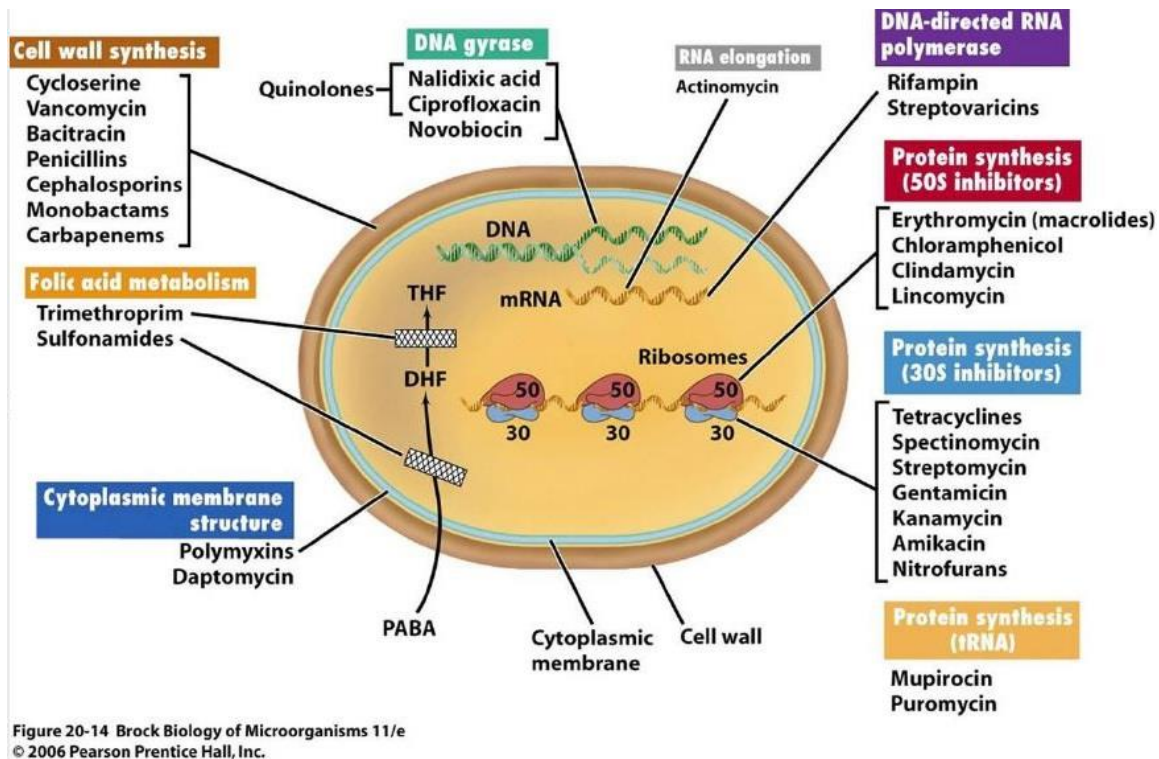


Figure 3: Mechanism of action of different antibiotics

1.7.2 Irrational uses of antibiotics

A common global problem is irrational use of medicines, not only antibiotics include others. It has been evaluated that near half of all medicines are dispensed, prescribed or sold inappropriately and that near half of all patients take their medicines according to dispensed or prescribed. Irrational use of medicines can harm patients in terms of poor patient outcome, unnecessary adverse reactions and wastage of resources, often out of pocket payments by patients.

Irrational use of antibiotics is particularly serious because it is contributing to antimicrobial resistance that is increasing rapidly worldwide and is causing significant morbidity and mortality and millions of dollars' worth of extra health-care costs annually [18].

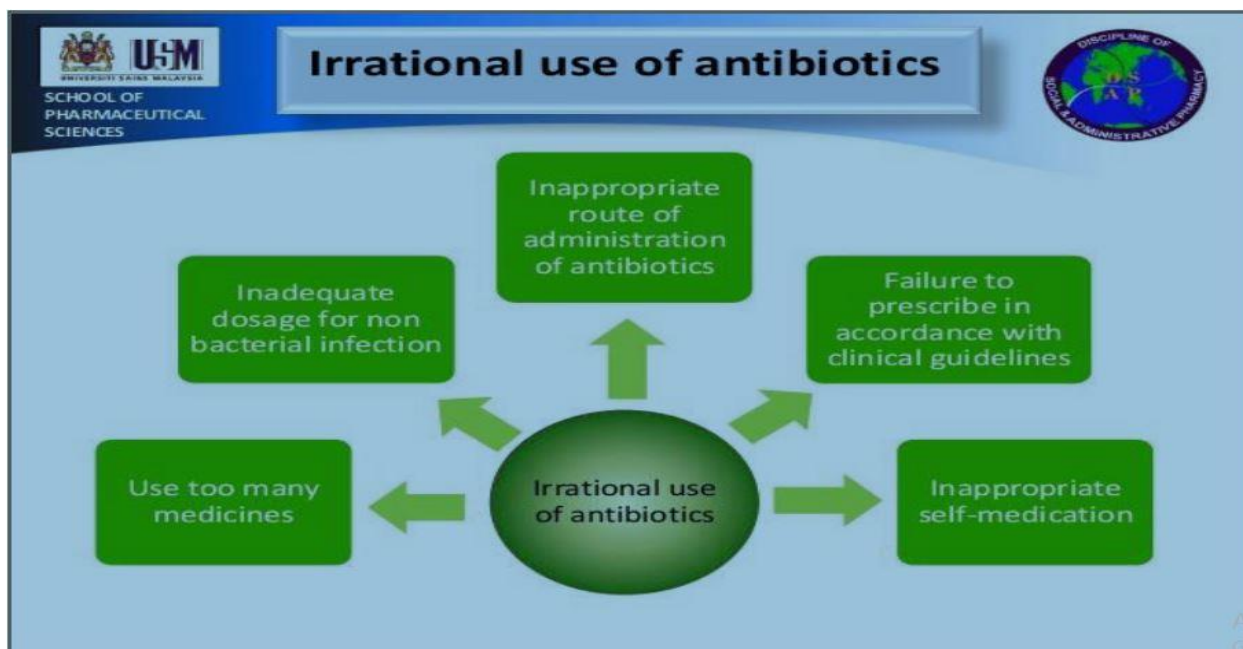


Figure 4: Irrational use of Antibiotics [19].

1.7.3 Rational use of antibiotic

One of our most cost effective health care interventions is medicines in where the most effective therapeutic classes of medicine is antibiotics and the use of antibiotics are monitoring only few low-and middle- income countries. In many health management information systems, data on medicines use is conspicuously absent. On the contrast developed country (Europe), taking action to combat irrational antibiotic use because they are now monitoring antibiotic use.

From the studies published between 1990 and 2000, WHO headquarters developed a database of quantitative information on medicines use in primary care in developing countries so that the WHO can monitor the progress in developing countries. From 97 countries studies numbering 679 were identified of which the SEA Region done 151 studies [20].

Data show that in middle-income and low-income countries less than 30% in the private sector and less than 40% patients in the public sector are treated in compliance with clinical guidelines and that over the last 20 years the situation has not improved significantly. With regard to use of antibiotics in the Region, it was found that:

- ❖ Just fifty three percent (53%) of pneumonia cases get a suitable antibiotic but fifty percent (50%) of viral upper respiratory tract disease cases are treated unnecessarily with antibiotics;
- ❖ In case of acute diarrhea cases fifty four percent (54%) are treated unnecessarily with antibiotics, and just fifty five (55%) get oral rehydration solution as suggested in the guidelines; and
- ❖ In case of prescribed antibiotics forty percent (40%) are prescribed in under-dose.

It was further found that less than 1 minute was the average patient-dispenser interaction time, which only about 40% patients were given dosage instructions. Some of the drugs were adequately labeled, and that only about 60% patients knew depending on leaving the facility how to take their medicines immediately.

For the irrational use of antibiotics there is now ample evidence of rampant together with under implementation of effective interventions and policies to promote rational use of antibiotics ^[20].

It is now urgent that countries and the international community take action; this is contributing to antimicrobial resistance. Number of possible reasons for this may include –

- Firstly, advancing rational use of drugs and containing antimicrobial resistance, the health care systems of numerous nations are not

institutionalized. In the event that to ensuring appropriate use there is no division, who will do the necessary antibiotic use monitoring and coordination of actors and policy. By contrast the modern rich countries have invested in national monitoring of antibiotic use and to promote rational use of antibiotics doing nationwide campaigns.

- Secondly, an extra investment with a great deal will be needed to the health care systems restructure and to the necessary activities undertake.
- Thirdly, wellbeing frameworks have become increasingly fragmented among other reasons, because of expanded virtualization and donor demands.
- Fourthly, there is an enormous awkwardness of data, the pharmaceutical company to promote their products to the prescribers and dispensers, they spending huge amounts of money while governments spend virtually nothing on continuing medical education.
- Fifthly, while a considerable amount is thought in the public sector, about how to enhance the use of medicines, very little is thought at a national level about how to promote rational use, incorporating casual sectors and the private, especially in countries lacking in resources to fund huge government bureaucracies ^[20].

1.7.4 Consequences of irrational use of Antibiotics

Antibiotic resistance now a high level has major consequences for society, and who have the least access to health care especially for those on the margins.

The right antibiotic treatment is now delaying which increases the chance of complications and severity and forces the antibiotics use of more potent and costlier. By using with antibiotics simple infections may need to be treated that

need hospitalization and that increase the overburdened hospital system pressure. Most importantly, many people may die since microbes developed may have the means to destroy the very antibiotics ^[21, 22].

The rise of antibiotic resistance it is therefore important to look at what could be promoting. The inappropriate use of antibiotics is one of the possible causes of this phenomenon. Community studies have indicated that for diarrhea and fever illnesses, approximately 70% of patients are given antibiotics to going to health facilities. This is increased antibiotic resistance due to inappropriate use of antibiotics (since antibiotics have little effect on viruses) ^[23].

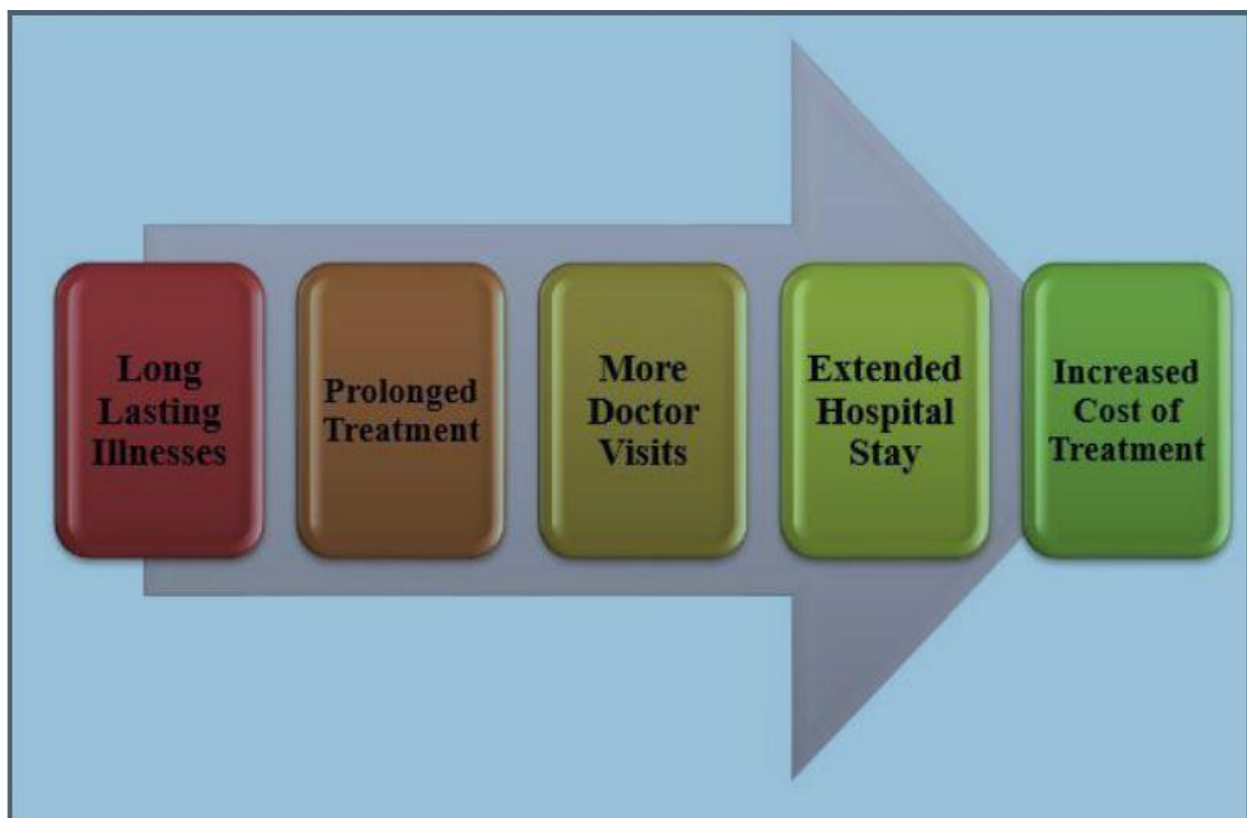


Figure 5: Consequence of Antibiotic resistance ^[24].

1.7.5 National policies to improve use of antibiotics

It will be extremely hard to achieve and maintain improved antibiotic use without an ideal strategy structure so how medicines are used impact by National policies.

Improving the Use of Medicines the Second International Conference noticed that continued irrational use of medicines, that there implementation of interventions was relative absence.

Therefore, they recommended that to monitor medicines use countries implement national programs and to coordinate implementation of interventions, targeting in both public and private sectors multiple levels of the health care system, to improve use of antibiotics.

WHO recommends encouraging appropriate use of medicines but It can be seen that many countries are not implementing many basic policies Although it may appear that between 2003 and 2007 the number of countries implementing policies has increased, caution must be used when interpreting the figures, particularly for the SEA Region, since the very small sizes sample and different years different countries was responded. ^[25].

1.7.6 Issues related to irrational use antibiotic

The people in remote rural regions of the country, the poor and marginalized sections of society and due to an unhealthy environment and inadequate nutrition those at risk of disease and are the most affected. Not only can the poor not afford antibiotics, for the rapid rise of antibiotic resistance, they are also most affected ^[26].

A high level of antibiotic resistance has major consequences for society, and who have the least access to health care especially for those. The right antibiotic

treatment is delaying, forces the use of more potent and costlier antibiotics that increases the chance of severity and complications. By antibiotics simple infections to be treated that need hospitalization and that increase the pressure on the overburdened hospital system [27, 28].

This raises many ethical issues as we will see when we take a closer look at some of the factors and players that have an impact on irrational antibiotic use.

1.7.6.1 The responsibility of doctors

Antibiotics are taken without question, when a doctor gives it to a patient. However, a doctor is often pressurized for a variety of reasons to give antibiotics. It could be due to the patient well as soon as possible, or the fear of losing patients to another doctor because patients often demand powerful treatments [29].

1.7.6.2 The role of the public

In this time of data it is unexpected that, numerous individuals in this nation are unable about health matters to educate themselves. About diseases they are not well educated that a common cold, for instance, does not need to be treated with antibiotics because it is caused by a virus [29].

1.7.6.3 Pharmacists and chemists shops

Chemists` shops known as medical shops are very common in numerous cities and towns. Patients go directly to a chemist, narrate their symptoms and ask for medication although many shops are situated near doctors` clinics. Without a doctor`s prescription the pharmacist gives his most often regularly prescribes antibiotics and diagnosis. The issue is additionally aggravated by the fact that many shops are manned by people who may not have even passed secondary school or not by qualified pharmacists [29].

1.7.6.4 The pharmaceutical industry

Industry and medical representatives more than some other player "push" irrational antibiotic use because all things considered, cash makes the world go round that why health experts get incentives for prescribing and dispensing specific brands of medicines ^[29].

1.7.6.5 The government

Policies are not strictly implemented in hospitals and for irrationally prescribing an antibiotic neither are there sufficient punishments. The Drug Controller`s office is understaffed and overworked with clinical trial approvals, quality assessments and documentation on the other hand manpower for regulating misuse, abuse and overuse of drugs is thus minimal, it would be interesting to know how knowledgeable policy makers are about the consequences of inappropriate antibiotic use ^[29].

1.7.6.6 Other players

A significant amount of inappropriate antibiotic use there are other players who may be contributing. For both animal and agricultural purposes, farmers overuse antibiotics and though there are specific antibiotics for these uses, in practice, many antibiotics used for humans are used in animal husbandry and agriculture that leads to cross-resistance for humans and consequently high resistance ^[29].

1.8 Essential drugs and medicines

Essential drugs (EDs) are the foundation for nearly every public health program. EDs aimed at reducing morbidity and mortality in Bangladesh as well as in the developing world. Essential drugs are those that satisfy the priority health care needs of the people. Essential drugs are selected with due regard to disease prevalence, evidence on efficacy and safety, and comparative cost-effectiveness (WHO, 2012).

As per WHO (2012) essential medicines are planned to be accessible inside the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality, and at a price the individual and the community can afford (WHO, 2012).

Careful selection of a limited range of essential medicines results in a higher quality of care for patients, better management and use of medicines and more cost-effective use of health resources. Clinical guidelines and lists of essential medicines may improve the availability and proper use of medicines within health care systems (WHO, 2012). Most countries have national lists and some have provincial or state lists as well.

List of essential drugs of Bangladesh about antibiotics is given below:

1.8.1 Essential drug list of Antibiotic

Serial no	Name of Drug
1	Amoxicillin
2	Ampicillin
3	Benzathine benzyl penicillin
4	Benzyl penicillin
5	Tetracycline
6	Ciprofloxacin
7	Procain benzyl penicillin
8	Streptomycin
9	Cloxacillin
10	Doxycycline
11	Erythromycin
12	Gentamycin
13	Gentamycin + Hydrocortisone
14	Metronidazole
15	Neomycin Sulfate + Bacitracin
16	Nitrofurantoin
17	Paromomycin
18	Phenoxyethyl penicillin
19	Clotrimazole

Table 1: Essential drug list of Antibiotic (Bangladesh gazette, 2008)

CHAPTER # 2

AIMS & OBJECTIVE OF THE STUDY

2.1 Aims of the study

- Better understand the prescription pattern of medications in different hospital in Faridpur city.
- Current pattern of antibiotics prescription in different hospital in Faridpur city.
- Find out the most prescribed antibiotic.
- Find out the brand leader of antibiotics.

2.2 Objectives of the study

The objective of this study is to gain a better understanding of prescription pattern of Antibiotics and the usage of these agents in different types of patients with different types of diseases.

CHAPTER # 3

METHODS & MATERIALS

3. METHOD

A cross-sectional, observational hospital based study was conducted in order to evaluate prescription pattern of antibiotic drugs in patients with various infectious diseases. On the basis of inclusion and exclusion criteria prescriptions were collected from all patients (both male and female) attended the outpatient (OPD) and inpatient departments (IPD) at different general and specialized government and private hospitals in Faridpur city. The methodology for the current survey was adapted in a way where statistical procedures were solely used. For better understanding, the methodology has been designed to follow a number of steps including selection area, duration of survey, sampling, data collection, data processing and graphical representation and specification.

3.1 Selection of the area

Due to financial and time constraint, Faridpur city were selected as the study area.

In this survey the prescription are collected from the following hospital:

- Faridpur Medical College Hospital, Faridpur
- Al Modina Pvt. Hospital, Faridpur

3.2 Duration of survey

Duration of survey was 3 months commencing from 15, April 2018 to 15, July 2018. To complete the survey in time, a work schedule was prepared depending on different tasks of the study. One month was spent for selection of topic, development of the protocol. Subsequent months were spent on official correspondence, data collection, data analysis, and report writing.

3.3 Sampling design

A sampling design is a definite plan for obtaining a sample from a given area randomly. It refers to the technique of the procedure the researchers would adopt in selecting items for the sample. In this survey the prescription are collected from both outdoor and indoor patient in the hospital. The patients who are visiting general practitioner and specialist doctors also counted. During the period of sampling certain information are extract from the prescriptions to be collected. The information was related to the prescribing of the drugs for specific disorder from which specific disease are recognized.

3.4 Inclusion Criteria

In my study both pediatric and geriatric patients are included and the prescription that bears significant impact on

Patient age: 1 year to old aged

Patient sex: Both male and female

Doctors: Having specialization on any discipline

Area: Faridpur

Specifically on the number of medicines like antibiotics prescribing frequency have been included

3.5 Study Population

From 15-April 2018 through 15-July 2018, during this period total of 250 prescriptions are collected from government and non-government hospitals specifically from specialist doctors of both male and female patients.

3.6 Data processing and graphical representation

Finally all the collected raw data are processed and represented to various aspects through MS- Excel.

3.7 Materials

In any kind of thesis work certain kinds of materials are required to express the whole thing. Here certain software has helped me to achieve my goal. Drug data and patient characteristic data were computed using MS-Excel. The results were expressed as proportions or as percentages. The retrieved medical records contained most of the required information.

CHAPTER# 4

RESULT & DISCUSSION

4. RESULTS

This survey was mainly designed to see the prescription pattern of antibiotic drugs which are prescribed from different Hospitals in Faridpur city where a total number of 250 medical case records were collected, scrutinized and analyzed for drug prescription over a period of 3 months. Out of 250 patients, 157 (62.80%) were male and 93 (37.20%) were female (including children and adults) are shown in (Table 2). Considering the exclusion and inclusion criteria 250 prescriptions were taken into account among which 228 (91.20%) were outpatients while 22 (8.80%) were inpatients (Table 2).

Table 2: Tabular representation of demographic data of patients

Gender of patients			Patients types		
Gender	No. of patients	%	Types of Patients	No. of patients	%
Male	157	62.80	Out patients	228	91.20
Female	93	37.20	In patients	22	8.80

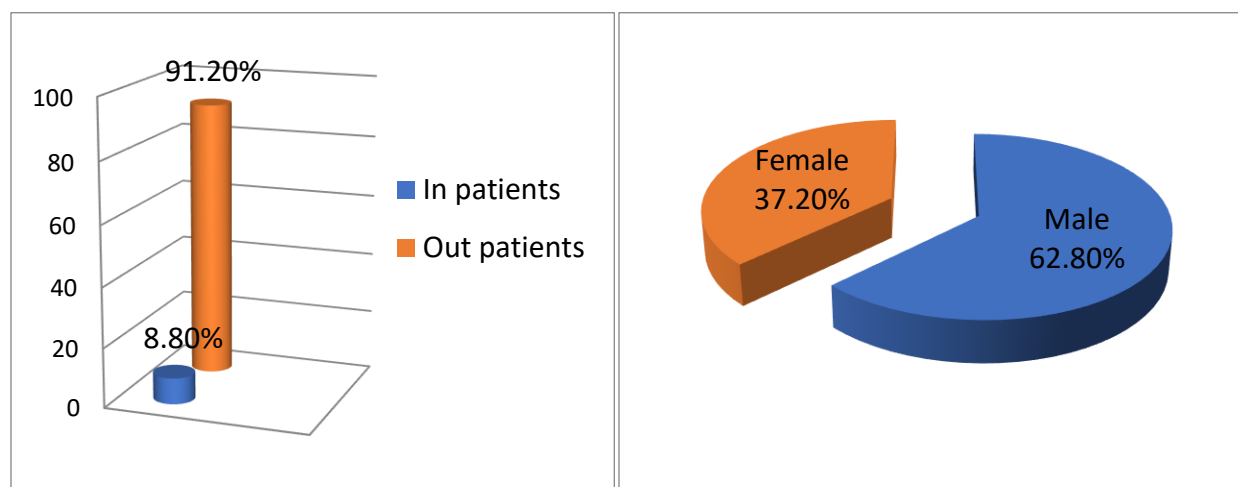


Figure 6: Percentages in- and out patients & male-female data of total prescription

From the total 250 prescriptions I have found that, 68% of total prescription containing ENT disorder and the number of prescription 170 out of 250, 16% of total prescription containing orthopedic disorder and the number of prescription 40 out of 250 and the rest of 40 prescription that means 16% prescription form others disorder (Table 3).

Table 3: Proportion of prescription containing different diseases from the total 250 prescription

Diagnosis	Number of cases N=250	(%)
ENT infections	170	68
Orthopedic disorder	40	16
Others	40	16

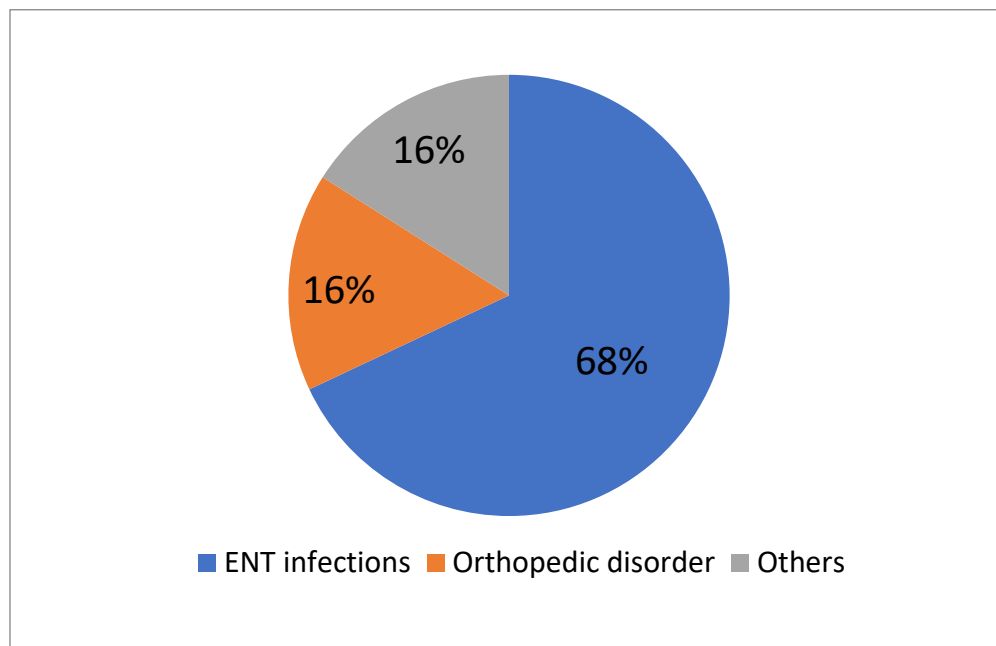


Figure 7: Percentage of prescription containing different diseases

4.1 Analyzing the prescriptions

A total of 1036 individual drugs were prescribed for 250 drug encounters, giving an average of 4.14. The range of drugs per encounter varied from 2-7. There was not a single prescription wherein no drug or only one drug was prescribed. As shown in Table 4, four (4) drugs were prescribed in 124 prescriptions (49.60%) was found to be highest among 250 prescriptions. 19.20% (48) patients were prescribed up to 3 drugs and the rest 80.80% (202) patients were prescribed from 4 to 7 drugs.

Table 4: Number of drugs prescribed per prescription

Prescription containing number of drugs	Number of prescription	%	N [%]
Two	6	2.40	19.20
Three	42	16.80	
Four	124	49.60	88.80
Five	69	27.60	
Six	6	2.40	
Seven	3	1.20	

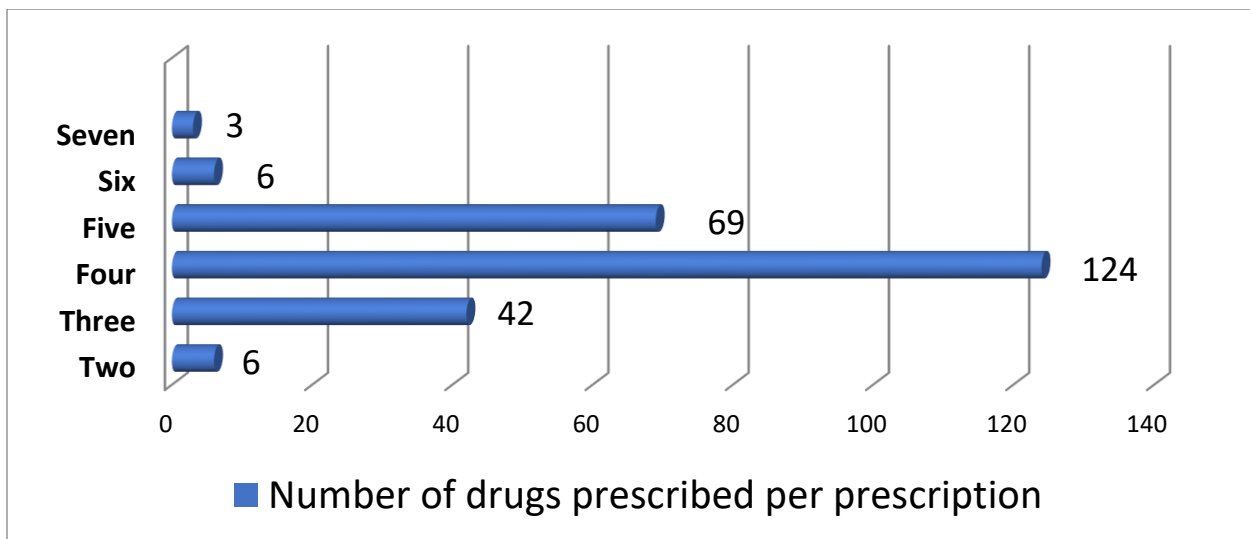


Figure 8: Number of drugs prescribed per prescription

Table 5: Proportion of prescription containing antibiotics from the total 250 prescription

Institution	No of Prescription	Prescription containing antibiotics	%
Faridpur medical college hospital	200	148	74.00
Al modina Pvt. Hospital, Faridpur	50	36	72.00
Total	250	184	73.60

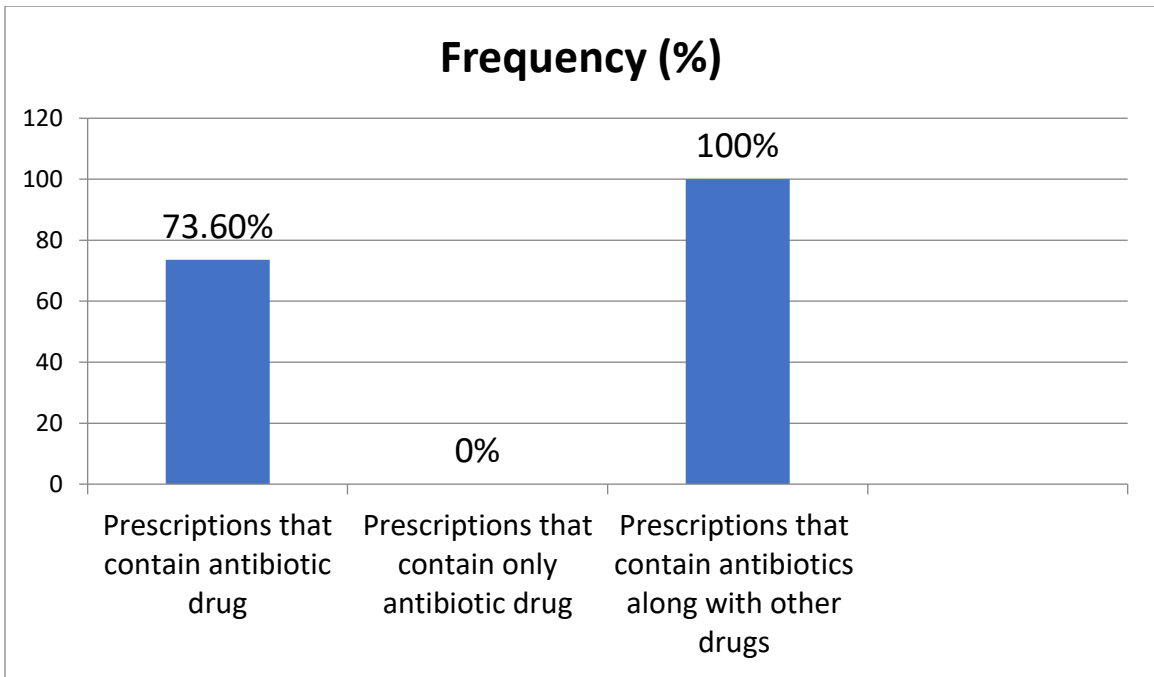


Figure 9: Percentage of demographic of antibiotic drugs

It was observed that the medication for all these common infections involved antibiotic drugs along with other drugs. Approximately 73.60% prescription contained antibiotic drugs and almost all prescription (100%) contained antibiotic drugs along with other drugs as shown in (Figure 9).

Groups of drug that were commonly prescribed were Antiulcerant 197 prescriptions (78.80%) then NSAIDs 47.20%, Multivitamins and minerals 38.40% and Antihistamines 26.80%. The four most commonly prescribed groups of drugs are shown in Table 6.

Table 6: Four most commonly prescribed group of drugs

Diagnosis	Number of cases N = 250	(%)
Antiulcerants	197	78.80
NSAIDs	118	47.20
Multivitamins & multiminerals	96	38.40
Antihistamines	42	16.80

Among the 250 collected prescriptions, 184 prescriptions were found containing one or more antibiotic drugs. From this analysis we found that 41.85% prescription contained single antibiotic drug, 58.15% contained two antibiotic drugs and no prescription contained more than two antibiotic drugs as shown in (Table 7).

Table 7: Number of antibiotics prescribed per prescription

Prescription containing number of drugs	Number of prescription N=184	%
One	77	41.85
Two	107	58.15
Total number of antibiotics -291		

4.2 Generic name vs. brand name

In the below Figure 6 it was found that drugs are mainly introduced by their brand names and from 291 antibiotics found that as most of our physicians mentioned the brand name 271 (93.13%) instead of the generic name 20 (6.87%) while prescribing antibiotics.

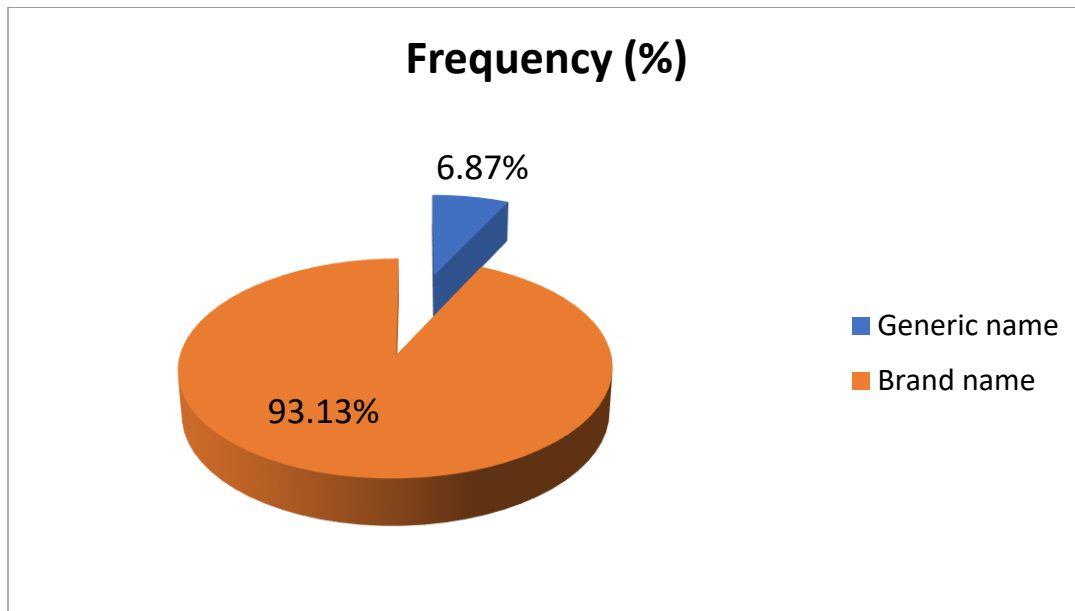


Figure 10: Percentage of prescription declaring brand name or the generic name of antibiotics

It was found that antibiotics like Clavusef, Cefotil, Xiclav, Ceftid, Cef-3, Levox, Zemicef, Ximeceff, Amoxicillin, Levofloxacin, Cefradine, Tocef, etc. were mostly used for the treatment of out-patients in the hospitals. Other drugs like Naproxen Plus, Paracetamol, Xidolac was commonly used to reduce the pain, while Antihistamin drugs and PPI drugs (Rabeprazole, Omiprazol, Esomeprasol etc) were used in combination with the antibiotics. On the other hand, antibiotics including Beuflox-D (Ciprofloxacin) Eye/Ear Drops were concurrently used for most ENT patients.

Table 8: The table of the Percentage (%) of different generic of Antibiotic

Generic name Of Antibiotic	Total Number of antibiotic N=291	Percentage (%)
Cefuroxime	67	23.02
Cefixime	52	17.87
Ciprofloxacin	48	16.49
Levofloxacin	34	11.68
Flucloxacillin	28	9.62
Amoxicillin	23	7.90
Cefpodoxime	8	2.75
Cephadrine	7	2.40
Others	24	8.25

The above percentage of the generic Antibiotics show that the Cefuroxime is the highest area of 23.02%, and then prescribed commonly Cefixime 17.87% then Ciprofloxacin 16.49%, Levofloxacin 11.68%, Flucloxacillin 9.62%, Amoxicillin 7.90%, Cefpodoxime 2.75%, Cephadrine 2.40% and others generic of antibiotics 8.25%.

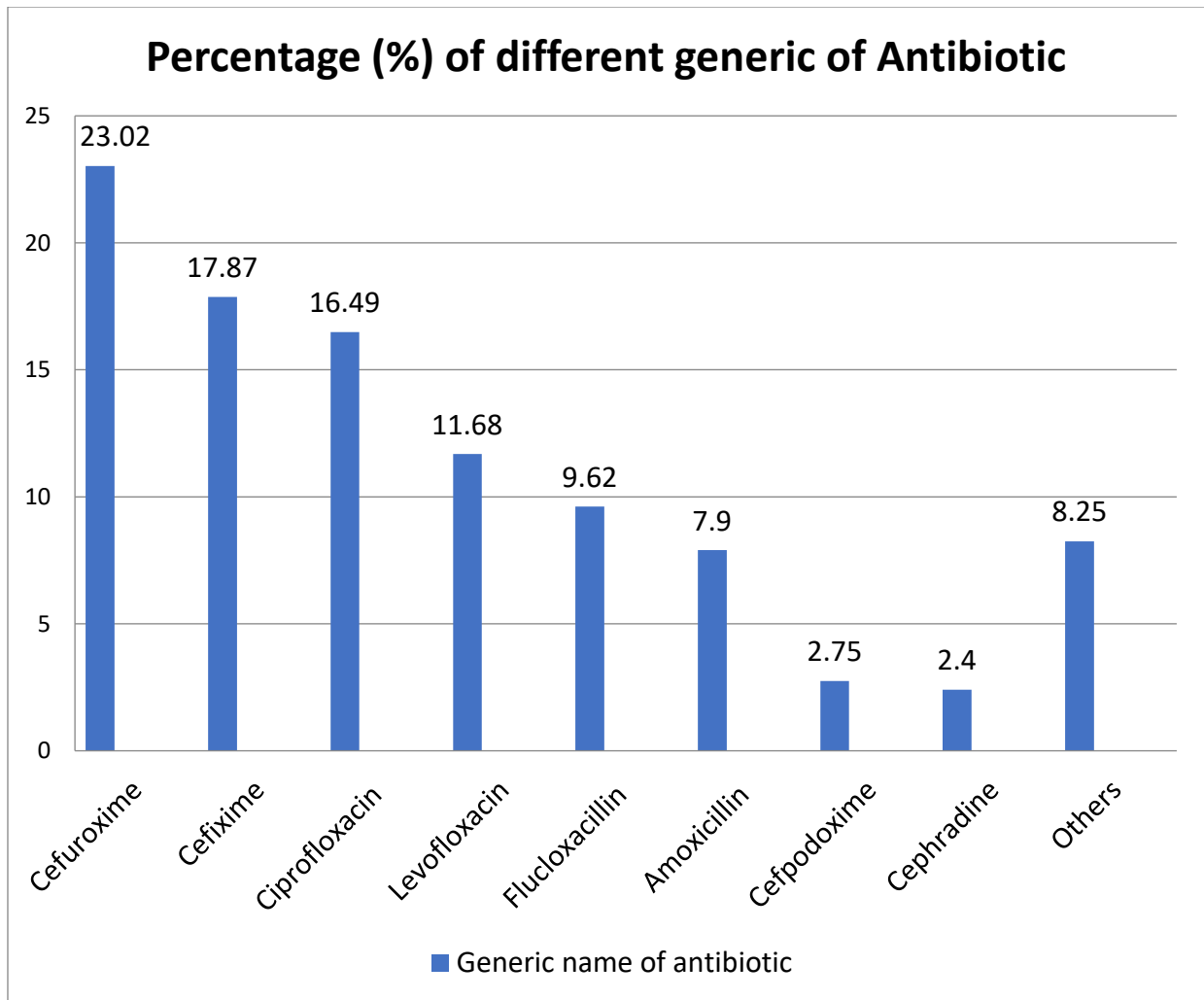


Figure 11: Percentage of different generic of Antibiotics.

Table 9: The table represent that the antibiotics shares among the top 5 pharmaceutical companies in bangladesh

Si No	Pharmaceutical company	No of antibiotic (n= 291)	Percentage (%)
1	Opsonin pharma Ltd.	72	24.74
2	Square pharmaceuticals Ltd.	56	19.24
3	Popular pharmaceuticals Ltd.	53	18.21
4	Beximco pharmaceuticals Ltd.	37	12.71
5	Incepta pharmaceuticals Ltd.	25	8.59
6	Renata Ltd	14	16.50
8	Eskayef Bangladesh Ltd	11	
9	Drug International Ltd	9	
10	Aristopharma Ltd	8	
11	Healthcare pharma Ltd	6	

From the above representation I have found that the, share of antibiotics among the different pharmaceutical company among the prescription I have collected is in Opsoninpharma Ltd 24.74%, Square pharmaceutical limited 19.24%, Popular pharmaceutical Ltd 18.21%, Beximco pharmaceutical limited 12.71%, Incepta pharmaceutical limited 8.59%, and the rest 16.50% antibiotics prescribed form others pharmaceutical company.

From the result we observed that the Opsoninpharma Ltd shares highest antibiotics from the other pharmaceutical companies.

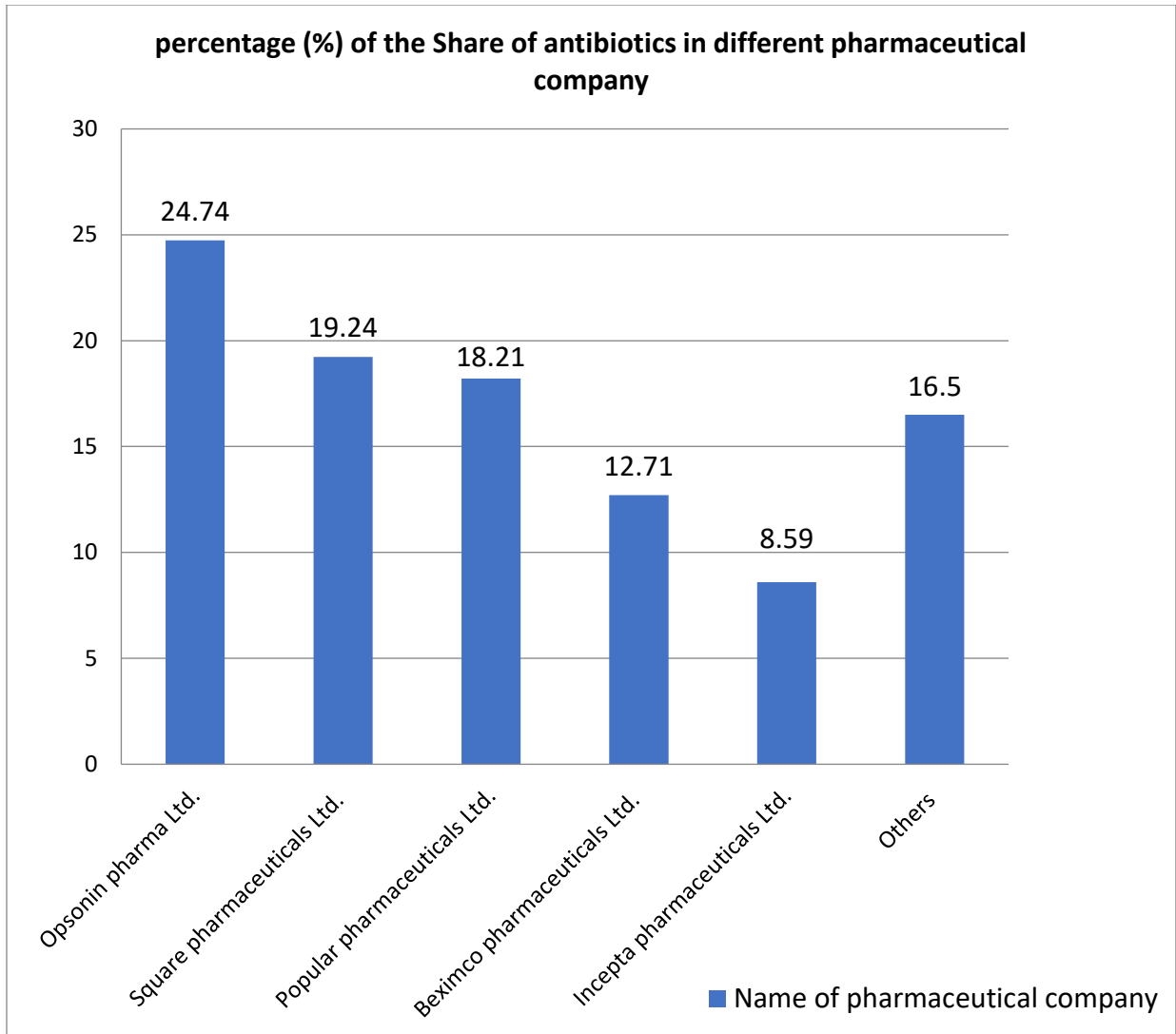


Figure 12: Percentage of the share of antibiotics among the different pharmaceutical company

4.3 DISCUSSION

A prescription that is given by a doctor or physician is taken as an indication of the doctor's or physician's attitude towards the disease and the role of drugs in its treatment ^[30]. The central priority of health care system is providing the right medicine to the right people at the right time ^[31]. The source of data for the current survey involved prescriptions of patients suffering from Orthopedic disorder, infectious diseases associated with ENT and others that was collected from Orthopedic, ENT and other department of hospitals in Faridpur city. For this purpose most prospective general and specialized government and private hospitals of Faridpur city were covered to count and examine the prescriptions. In this present study 250 medical cases were collected and out of 250 patients 228 (91.20%) were outpatients while 22 (8.80%) were inpatients (Table 2). The percentages of male and female patients were 62.80% and 37.20% as shown in (Table 2) where most of the patients were male. Similar results were obtained from the previous study which was conducted by Khan et al. 2011 ^[32]. This prospective study was conducted on 4800 patients who visited the OPD and IPD of ENT department of Teerthanker Mahaveer Medical Hospital and Research Centre of North India. Their result indicated that higher percentage of male person suffering from ENT infections. Similar result was found in previous surveys conducted in India and Nepal in different years with varying number of patients [30, 33-37].

The present observation remarked that the medication for all common ENT infections, orthopedic disorder and others disorder involved antibiotic drugs along with other drugs. The survey reported that 73.60% prescription contained antibiotic drugs and almost all prescription (100%) contained antibiotic drugs along with other drugs (Figure 9). On the basis of the results of prescription analysis about

41.85% prescription contained single antibiotic drug, 58.15% contained two antibiotic drugs and no prescription contained more than two antibiotic drugs as shown in (Table 7). This result indicated polypharmacy. Polypharmacy is known to cause unnecessary adverse reactions, drug interactions, and complications [38]. On the other hand, 78.80% prescriptions contained antiulcerants, 47.20% contained NSAIDs, 38.40% contained vitamin/calcium/iron supplements and 16.80 contained antihistamines (Table 6). Frequency of analgesic prescription in our study is the highest reported among studies from other countries (11.9% to 30%) [39-42]. Compared to multivitamin prescription of our study (37.8%) other studies in the region report varying frequencies from 5.9% to 50% [40, 41, 43-45]. Most of the prescribed drugs were administered orally which was found to be similar as previous study in 2015 where 855 prescriptions were evaluated from SRTR Government Medical, Maharashtra, India [46]. In our present study most of the drugs (93%) were prescribed by brand name which coincides with the report from the survey conducted by previous study [46, 47].

A total number of 291 antibiotic drugs were found in 184 prescriptions among which antibiotics that lie under β -Lactam class (Cefuroxime, Cefixime) were most commonly prescribed. A similar incident was reported in the previous study [48, 32, 33, 49-51]. Besides, Cefixime 17.87%, Ciprofloxacin 16.49%, Levofloxacin 11.68%, Flucloxacillin 9.62%, Amoxicillin 7.90%, Cefpodoxime 2.75%, Cephadrine 2.40% and others generic of antibiotics 8.25% were observed to be prescribed in the present survey and Opsoninpharma Ltd 24.74% is the highest seller of antibiotics and then Square pharmaceutical limited 19.24%, Popular pharmaceutical Ltd 18.21%, Beximco pharmaceutical limited 12.71%, Incepta pharmaceutical limited 8.59%, and the rest 16.50% antibiotics prescribed form others pharmaceutical company.

4.4 CONCLUSION:

The examination has been directed based on the basis of prescription pattern of antibiotics in different specialist of doctors in Faridpur city. This kind of study will help to judge the rationality of prescribing antibiotics among the various specialist doctors in various territories of Bangladesh. So there is a significant extent of change in the prescribing practices, especially prescribing by generic names which has less financial burden on patients.

For accomplishing the objective of rational use of medicine, it is essential to choose right medicine should be administered in the appropriate manner, keeping the number of medication as low as possible, using generic names, using the medicine appropriately after selecting consciously keeping the cost of the therapy low and by consulting the WHO or National essential drug list. At the end of the day rational drug must be strictly followed. So observing of use of antibiotic is very crucial in this time.

The spread of bacterial resistance to antibiotics and related health problems prompts by the irrational use of antibiotics; our findings have the enforcement of regulations regarding the prescription of antibiotics in Bangladesh and important implications for public education.

The investigation likewise encourages the doctor, when antibiotic is prescribed for the patients to be more expert, professional and careful. To reduce the use of antibiotics viable methodologies ought to be taken by the Government of Bangladesh which could include strengthen the control of antibiotics selling, development of policies to support the judicious use of antibiotics, and implement educational campaigns for prescribers.

CHAPTER # 5
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