Rational Use of Drugs - A Prescription Based Study at Rangpur

A Research report submitted in partial fulfillment of the requirements for the degree of Bachelor of Pharmacy

Submitted by

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Dedicated to my parents Ismat ara Begum & Md. Istahaque

CERTIFICATE

This is to certify that the thesis "A Prescription Based Study at Rangpur" submitted to the Department of Pharmacy, East West University, Mohakhali, Dhaka in partial fulfillment to the requirements for the degree of Bachelor of Pharmacy (B.Pharm) was carried out by Md.Mahshid Farhan (2006-1-70-016) under our guidance and supervision and no part of the thesis has been submitted for any other degree. We further certify that all the sources of information availed of this connection is duly acknowledge.

Sufia Islam 27.06.2011

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...........Khatun 26/06/2011......

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Content

ABSTRACT

Rational Prescribing implies using the right drug for the right patient at the right time in the right dose and manner of administration, at affordable cost and with right information. Rational use of drugs has multi- dimensional aspects which include medical, social and economical values. Medicines are one of the important basic needs for human being. Medicines are to be used in an appropriate and safe way and only when needed. The main objective is to promote the "Rational use of medication" and "Essential drugs concept" in Bangladesh in order to optimize the usefulness of medicines and help bring equity in their access to promote rational prescription, identify magnitude and nature of inappropriate drug utilization and factors which influence the behavior of prescribers and patients, understand the adverse impacts of inappropriate use of drugs; describe factors which influence the decision-making process and specific medication use problems, find out the way of improving rational use of drug by following WHO patterns. This study was conducted in Rangpur medical college and in few clinics situated at Rangpur district. Patient based prescription audit was conducted and 91 prescriptions of patients were collected prospectively between January 2010 to July 2010. The survey was conducted among the in-patients and out-patients. Patient consent was taken and their respective prescription was copied, the data was collected and evaluated by using WHO guidelines.

CHAPTER:01
INTRODUCTION

1. INTRODUCTION

"The prescription order is important therapeutic transaction between the clinician and the patient" (Ansari 1998) prescription writing is a science and an art (Kumaraj 2008).

Prescription audit shows the way towards writing rational prescriptions. Rational use of drugs has multi- dimensional aspects which include medical, social and economical values;(Bhatnagar 2003) these are well reflected in the WHO definition: "Rational use of drugs requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of time, at the lowest cost to them and their community. (WHO 1988; WHO1985)

To fulfill the requirements of rational use of drugs, process of prescribing is appropriately followed includes:

a) Defining patient's problems (or diagnosis).
b) Defining effective and safe treatments (drugs and non drugs)
c) Selecting appropriate drugs, dosage and duration.
d) Writing a prescription.
e) Giving patients adequate information.
f) Planning to evaluate treatment responses.

In third world country to provide affordable health care should be of prime importance, increasing cost of medicine can be minimized by promoting generic drugs selection from W.H.O essential drug list. According to WHO "Essential medicines are those that satisfy the priority health care needs of the population" (WHO, essential drug definition)

Generic drug is a substitute of branded drug without any patent protection, which is equivalent in term of doses strength, quality and performance moreover they are (40-60%) cheaper than innovator or band name drug (Sharma 2009). Prescription error is the commonest form of avoidable medication error which is the most important target for improvement. One of the study from U.K revealed that prescription error were maximum (45% of total error) for OPD section.

The aim of the study was to evaluate the prescribing pattern adopted by clinicians; my study was carried out at following levels (Manoj 2010) :

a) Whether the prescription was clearly written.

b) Whether the format of prescription was well defined.

c) Whether drug prescribed are rational and essential medicines by generic name.

1.1 Factors Underlying Irrational Use of Drugs

There are many different factors which affect the irrational use of drugs. In addition, different cultures view drugs in different ways, and this can affect the way drugs are used.

The major forces can be categorized as those deriving from patients, prescribers, the workplace, the supply system including industry influences, regulation, drug information and misinformation, and combinations of these factors.

a) Patients-drug misinformation, misleading beliefs, patient demands/ expectations

b) Prescribers (lack of education and training)-inappropriate role models, lack of objective drug information, generalization of limited experience, misleading beliefs about drugs efficacy

c) Workplace - heavy patient load, pressure to prescribe, lack of adequate lab capacity, insufficient staffing

d) Drug Supply System - unreliable suppliers, drug shortages, expired drugs supplied

e) Drug Regulation - non-essential drugs available, non-formal prescribes, lack of regulation enforcement

f) Industry – promotional activities, misleading claims

All of these factors are affected by changes in national and global practices. For example, the frequent use of injections is declining in many African countries because of the fear of AIDS. In some countries, however, the use of injectibles remains high due to false

assumption of prescribers that injections will improve patient satisfaction and that they are always expected by the patients (Ross-Degnan, 1992).

1.2 Pathology of Prescribing and Effects of Irrational Use of Drugs

Pathology of Prescribing means-

a) The use of drugs when no drug therapy is indicated
b) The use of wrong drugs for a specific condition requiring drug therapy
c) The use of drugs with doubtful or unproven efficacy
d) The use of drugs of uncertain safety status
e) Failure to prescribe available, safe, & effective drugs
f) Incorrect administration, dosages, or duration

Examples of Common Inappropriate Prescribing Practices

a) The overuse of antibiotics and antidiarrheals for nonspecific childhood diarrhea
b) Indiscriminate use of injections for malaria
c) Multiple or over-prescription
d) Use of antibiotics for mild, non-bacterial infection, e.g., URI
e) Tonics and multivitamins for malnutrition
f) Unnecessary use of expensive antihypertensive

This irrational prescribing practice leads to-

a) Reduction in the quality of drug therapy leading to increased morbidity and mortality.
b) Waste of resources leading to reduced availability of other vital drugs and increased costs.
c) Increased risk of unwanted effects such as adverse drug reactions and the emergence of drug resistance.

d) Psychosocial impact, such as when patients come to believe that there is "a pill for every ill", which may cause an apparent increased demand for drugs. (www.icm.tn.gov.in)

1.3 Realization Factors for Rational Drug Use

Rational drug use attained more significance nowadays in terms of medical, socio economical and legal aspect. Factors that have led sudden realization for rational drug use are:

1.3.1. Drug explosion: - Increase in the number of drugs available has incredibly complicated then choice of appropriate drug for particular indication.

1.3.2. Efforts to prevent the development of resistance: – Irrational use of drugs may lead to the premature demise of highly efficacious & life saving new antimicrobial drug due to development of resistance.

1.3.3. Growing awareness: - Today, the information about drug development, its uses & adverse effects travel from one end of the planet to the other end with amazing speed through various media.

1.3.4. Increased cost of the treatment: - Increase in cost of the drug increases economic burden on the public as well as on the government. This can be reduced by rational drug use.

1.3.5. Consumer protection Act. (CPA):- Extension of CPA in medical profession may restrict the irrational use of drugs.

1.4 Obstacles in Rational Drug Use Practices

a) Lack of objective information & of continuing
b) Education & training in pharmacology.
c) Lack of well organized drug regulatory authority & supply of drugs.

d) Presence of large number of drugs in the market & the lucrative methods of promotion of drugs employed by pharmaceutical industries.

e) The prevalent belief that "every ill has a pill." (Gautam, June'06; Gurbani, 2000; Adesh, 2001)

1.5 Steps to Improve Rational Drug Prescribing

1.5.1 Step: - I (Identification): Identify the patient's problem based on symptoms& recognize the need for action.

1.5.2 Step:-II (Diagnosis): Diagnosis of the disease. Identify underlying cause& motivating factors. This may be specific as in infectious disease or non specific.

1.5.3 Step:-III (Treatment): List possible intervention or treatment. This may be non drug treatment or drug treatment. Drug must be chosen from different alternatives based on efficacy, convenience & safety of drugs including, drug inter-actions & high risk group of patients.

1.5.4 Step:-IV (Prescription): Start the treatment by writing an accurate &complete prescription e.g. name of drugs with dosage forms, dosage schedule & total duration of the treatment.

1.5.5 Step:-V (Information): Given proper information instruction & warning regarding the treatment given e.g. side effects (ADR), dosage schedule & dangers/risk of stopping the therapy suddenly.

1.5.6 Step:-VI (Monitoring): Monitor the treatment to check, if the particular treatment has solved the patient's problem. It may be:

1.5.6.1 Passive monitoring - done by the patient himself. Explain him what to do if the treatment is not effective or if too many side effect occurs

1.5.6.2 Active monitoring- done by physician and he make an appointment to check the response of the treatment." (Gautam, June'06; Gurbani, 2000; Adesh, 2001)

1.6 Rational Use of Drugs Pattern by WHO (WHO conference 2010)

WHO advocates 12 key interventions to promote more rational uses:

a) Establishment of a multidisciplinary national body to coordinate policies on medicine use
b) Use of clinical guidelines
c) Development and use of national essential medicines list
d) Establishment of drug and therapeutics committees in districts and hospitals
e) Inclusion of problem-based pharmacotherapy training in undergraduate curricula
f) Continuing in-service medical education as a licensure requirement
g) Supervision, audit and feedback
h) Use of independent information on medicines
i) Public education about medicines
j) Avoidance of perverse financial incentives
k) Use of appropriate and enforced regulation
l) Sufficient government expenditure to ensure availability of medicines and staff.

1.7 Prescription Methods (WHO conference 2010)

Prescription pattern is studied to observe whether they confirm to following parameters of a typical prescription.

1.7.1 Evaluation on clarity of prescription was made using four point rating scale:

a) All aspects of prescription were very clear.

b) Clear but effort required to read.

c) One aspect (name of drug/dose/duration) not clear.

d) At least one aspect partially unclear.

1.7.2 Format of prescription:

a) Superscription includes the date the prescription order was written; the name, address, weight, and age of the patient; and the Rx.

b) Inscription this body of prescription contains the name and amount or strength of each ingredient to be compounded.

c) Subscription is the instruction to the pharmacist, usually consisting of a short sentence such as "make a solution," "mix and place into 30 capsules," or "dispense 30 tablets."

d) Signa or "Sig" is the instruction for the patient as to how to take the prescription.

1.7.3 Assessment of rational use of drugs:

The content of prescription was assessed and evaluation was done on the basis of extent of conformity to W.H.O guide to Good prescribing, a practical manual (W.H.O guide to Good prescribing) and list of essential Medicines(K.D Tripathi 2008).

1.8 Types of Dug Use Information (Folke Sjöqvist 2003)

Different types of drug use information are required depending on the problem being evaluated. These include information about the overall drug use, or use of drug groups, individual generic compounds or specific products. Often, information about the condition being treated, about the patient and about the 80 prescriber will be required. In

addition, data on drug costs will be important in ensuring that drugs are used efficiently and economically. These types of drug information are described below:

1.8.1 Drug based information: The trends in total drug use may sometimes be useful to know, but more detailed information is usually required to answer clinically important questions. This may involve aggregation of drug use at various levels, and information on indications, doses and dosage regimens.

1.8.2 Problem or encounter-based information: Instead of asking how a particular group of drugs is used, one may well address the question how a particular problem (e.g. sore throat, hypertension, gastric ulcer, depression) is managed.

1.8.3 Patient information: Demographic and other information about the patient will often be useful. The age distribution of patients will sometimes be of critical importance, for example to assess the likelihood of severe adverse effects with NSAIDs, or whether the drug is being used in an age group different to that in which the clinical trials were performed. The co-morbidities of the patient group may be important in determining treatment choice and adverse effects. As an example in the management of hypertension, beta-blockers should be avoided in patients with asthma, and ACE inhibitors preferred in patients with heart failure. Qualitative information such as knowledge, beliefs, and perceptions among patients and their attitudes to drugs will be important in some cases, for example in assessing patient pressures on doctors to prescribe antibiotics, or in designing consumer information/education programs.

1.8.4. Prescriber information: The prescriber is a critical point in determining drug use. Some sceptics even claim that doctors differ more than patients and that difference in drug prescribing often lack rational explanations. Dissecting the factors that determine prescribing behavior is therefore often central to understanding how and why drugs are prescribed.

1.9 Terminologies

1.9.1 Prescription Drug: A drug requiring a prescription, as opposed to an over-the-counter drug, which can be purchased without one. The word "prescription" comes from the Latin "praescriptus" compounded from "prae", before + scribere, to write = to write before. Historically, a prescription was written before the drug was prepared and administered (Medicine Net, Inc).

1.9.2 Brand name: a name given to a product by its manufacturer that becomes part of the product's identity. (Mosby's Dental Dictionary 2010)

1.9.3 Generic Drug: The term "generic" has several meanings as regards drugs:

    i.   The chemical name of a drug.

    ii.   A term referring to the chemical makeup of a drug rather than to the advertised brand name under which the drug is sold.

    iii.   A term referring to any drug marketed under its chemical name without advertising.

"Diazepam" is an example of the chemical (generic) name of a sedative (Medicine Net, Inc).

1.9.4 Over-the-counter (OTC) drugs: A drug for which a prescription is not needed. These drugs sell directly to a consumer without a prescription (Medicine Net, Inc). For example, Acetaminophen (Paracetamol) is an OTC Drug.

1.9.5 Antibiotic: A drug used to treat infections caused by bacteria and other microorganisms. Originally, an antibiotic was a substance produced by one microorganism that selectively inhibits the growth of another (Medicine Net, Inc).

1.9.6 Vitamins: The word "vitamin" was coined in 1911 by the Warsaw-born biochemist Casimir Funk (1884-1967). At the Lister Institute in London, Funk isolated a substance that prevented nerve inflammation (neuritis) in chickens raised on a diet deficient in that substance. He named the substance "vitamine" because he believed it was necessary to

life and it was a chemical amine. The "e" at the end was later removed when it was recognized that vitamins need not be amines. The letters (A, B, C and so on) were assigned to the vitamins in the order of their discovery. The one exception was vitamin K which was assigned its "K" from "Koagulation" by the Danish researcher Henrik Dam.

i. **Vitamin A**: Retinol. Carotene compounds responsible for transmitting light sensation in the retina of the eye. Deficiency leads to night blindness.

ii. **Beta carotene:** An antioxidant which protects cells against oxidation damage that can lead to cancer. Beta carotene is converted, as needed, to vitamin A. Food sources of beta carotene include vegetables such as carrots, sweet potatoes, spinach and other leafy green vegetables; and fruit such as cantaloupes and apricots. Excessive carotene in the diet can temporarily yellow the skin, a condition called carotenemia, commonly seen in infants fed largely mushed carrots.

iii. **Vitamin B1**: Thiamin, acts as a coenzyme in body metabolism. Deficiency leads to beriberi, a disease of the heart and nervous system.

iv. **Vitamin B2**: Riboflavin, essential for the reactions of coenzymes. Deficiency causes inflammation of the lining of the mouth and skin.

v. **Vitamin B3**: Niacin, an essential part of coenzymes of body metabolism. Deficiency causes inflammation of the skin, vagina, rectum and mouth, as well as mental slowing.

vi. **Vitamin B6**: Pyridoxine, a cofactor for enzymes. Deficiency leads to inflammation of the skin and mouth, nausea, vomiting, dizziness , weakness and anemia.

vii. **Folate (folic acid)**: Folic acid is an important factor in nucleic acid synthesis (the genetic material). Folate deficiency leads to megaloblastic anemia.

viii. **Vitamin B12**: An essential factor in nucleic acid synthesis (the genetic material of all cells). Deficiency leads to megaloblastic anemia, as can be seen in pernicious anemia.

ix.   **Vitamin C**: Ascorbic acid, important in the synthesis of collagen, the framework protein for tissues of the body. Deficiency leads to scurvy, characterized by fragile capillaries, poor wound healing, and bone deformity in children.

x.   **Vitamin D**: A steroid vitamin which promotes absorption and metabolism of calcium and phosphorus. Under normal conditions of sunlight exposure, no dietary supplementation is necessary because sunlight promotes adequate vitamin D synthesis in the skin. Deficiency can lead to osteomalacia in adults and bone deformity (rickets) in children.

xi.   **Vitamin E**: Deficiency can lead to anemia.

xii.   **Vitamin K**: An essential factor in the formation of blood clotting factors. Deficiency can lead to abnormal bleeding (Medicine Net, Inc).

1.9.8 Disease: A pathological condition of a part, organ, or system of an organism resulting from various causes, such as infection, genetic defect, or environmental stress, and characterized by an identifiable group of signs or symptoms. A condition or tendency, as of society, regarded as abnormal and harmful. (The American Heritage® Dictionary of the English Language, Fourth Edition ,2000)

1.9.10 Diagnosis: "Diagnosis" is a fancy name given to the process of identifying diseases. It is a Greek name. Break it down; "dia" means "by" and "gnosis" means "knowledge". Diagnosis is for doctors and physicians only. They determine disease by the signs and symptoms that gives by patients. (Tyler Brooker 2010)

1.9.11 Surgery: Surgery is the specialty of medicine that treats diseases and disorders by cutting, removing or changing the body with an operative procedure. Surgery is performed by a surgeon, a physician with specialized training in operative procedures. There are many surgical specialties providing treatment in all areas of the human body including the heart, brain, and bones. Surgeries can be minor outpatient procedures or major procedures such as a heart transplant. (RN Jennifer Heisler January 04, 2009)

1.9.13 Anorexia: Anorexia is an eating disorder where people starve themselves. Anorexia usually begins in young people around the onset of puberty. Individuals suffering from anorexia have extreme weight loss. Weight loss is usually 15% below the

person's normal body weight. People suffering from anorexia are very skinny but are convinced that they are overweight. Weight loss is obtained by many ways. Some of the common techniques used are excessive exercise, intake of laxatives and not eating. Anorexics have an intense fear of becoming fat. Their dieting habits develop from this fear. Anorexia mainly affects adolescent girls (Medicine Net, Inc).

1.9.14 Hepatitis: Inflammation of the liver, usually caused by any of various infectious agents or toxins, including alcohol and numerous chemical compounds. Symptoms usually include jaundice, fatigue, fever, liver enlargement, and abdominal pain. There are five types of viral hepatitis: A, B,C, D, and E. *Hepatitis A,* an acute infection caused by a virus of the genus *Hepatovirus* is transmitted by contaminated food and water. *Hepatitis B,* caused by a virus of the genus *Orthohepadnavirus* and Hepatitis C, caused by a virus of the genus *Hepacivirus,* are more serious infections that are transmitted through infected bodily fluids such as blood and semen. (The American Heritage® Science Dictionary © 2005)

1.9.15 Anemia: Anemia is a condition that occurs when the number of red blood cells (RBCs) and/or the amount of hemoglobin found in the red blood cells drops below normal. Red blood cells and the hemoglobin contained within them are necessary for the transport and delivery of oxygen from the lungs to the rest of the body. Without a sufficient supply of oxygen, many tissues and organs throughout the body can be adversely affected. Anemia can be mild, moderate or severe depending on the extent to which the RBC count and/or hemoglobin levels are decreased. (American Association for Clinical Chemistry, "Anemia"2009)

1.10 WHO Drug Use Indicators

Purpose of Drug use indicators are-

        a)   Objective measures (Indicators) that can describe the drug use situation in a country/region/Health facility.

b) These indicators will allow Health planners, Managers and Researchers, to make basic comparisons between situations in different areas or at different times.

c) The indicators can be used to measure the impact of the interventions undertaken.

d) The indicators can serve as simple supervisory tools to detect problems in performance of individual providers or Health facilities.

e) The drug use indicators can be used as "first line measures" to stimulate further questioning and to guide subsequent action (West Hartford 1997).

Indicators are developed to be used is measures of performance in three general areas, related to the Rational use of Drugs in Primary care.

a. Prescribing practices by Health providers

b. Patient care including both clinical consultation and pharmaceutical dispensing.

c. Facility specific factors which support Rational Use of Drug.

1.10.1 Prescribing Indicators

1.10.1.1 Average number of drugs per encounter = total number of drugs prescribed / total number of encounters surveyed;

1.10.1.2. Percentage of drugs prescribed by generic name = (number of drugs prescribed by generic name / total number of drugs prescribed) × 100;

1.10.1.3 Percentage of encounters with an antibiotic prescribed = (number of patient encounters during which an antibiotic was prescribed / total number of encounters surveyed) × 100;

1.10.1.4 Percentage of encounters with an injection prescribed = (number of patient encounters during which an injection was prescribed / total number of encounters surveyed) ×100;

1.10.1.5 Percentage of drugs prescribed from essential drugs list = (number of drugs prescribed from essential drugs list / total number of prescribed drugs) × 100.

1.10.2 Patient Care Indicators

1.10.2.1 Average consultation time = total time for a series of consultations / number of consultations

1.10.2.2 Average dispensing time = total time for dispensing drugs to series of patients / number of patient encounters

1.10.2.3 Percentage of drugs actually dispensed = (number of drugs actually dispensed / total number of drugs prescribed) × 100.

1.10.2.4 Percentage of drugs adequately labeled = (number of drugs adequately labeled / total number of drugs dispensed) × 100

1.10.2.5 Percentage of patients who can adequately report the dosage schedule for all drugs = (number of patients who can adequately report the dosage schedule for all drugs / total number of patients interviewed) × 100

1.10.3 Health Facility Indicators

1.10.3.1 Availability of key drugs = (number of specified drugs actually in stock / total number of drugs on the checklist) × 100

1.10.3.2 Availability of copy of essential drugs list or formulary at health facility: These indicators are of activity based measures, meant to describe practices in a representative sample of Health facilities. The drug use indicators can be collected at one time in a cross sectional survey, or otherwise.

1.10.4 Complementary Drug Use Indicators

1.10.4.1. Percentage of patients treated without drugs

1.10.4.2. Average drug cost per encounter

1.10.4.3. Percentage of drug costs spent on antibiotics

1.10.4.4. Percentage of drug costs spent on injections

1.10.4.5. Prescription in accordance with treatment guidelines

1.10.4.6. Percentage of patients satisfied with care they received

1.10.4.7. Percentage of health facilities with access to impartial drug information. (Bhagavan 2010)

1.11 Role of a Pharmacist

The Pharmacist should update his knowledge, capability and learn the skill to promote rational use of Drugs: (World Health Organization (WHO) 2010, "Rational use of medicines")

a) The pharmacist should study the formulation / combination fully in the light of the claims of the manufacturer.

b) The pharmacist should keep track of the quantity procured by the patient and watch out for the patient's tendency to buy irrational quantity disproportionate to the prescription.

c) The pharmacist should keep a silent watch on patient to know whether he / she is changing over to another clinician being unable to buy the drugs / being not satisfied with the relief.

d) The pharmacist should discuss academically the observed facts with colleagues and academicians to understand their views and experience, but never reveal the name of the patient or the doctor

e) Pharmacists should attend conferences / seminars and workshops on Rational Use of Drugs organized by professional organizations.

f) The pharmacist perhaps is the best-suited person to educate and help the patients in situations like;

    i.   Irrational self medication

     ii.   Sharing the drugs of others in the family

     iii.   Using the left over drugs

     iv.   Consuming certain non-prescription drugs along with the prescribed drugs.

g) Pharmacist should not hesitate to discuss the issue with the clinicians, the information of the following type (with out disclosing the identity of the patient)

     i.   Patients not buying full course of medication due to high cost,

     ii.   Patient not buying / consuming all the medicine as prescribed due to more number of drugs being prescribed.

     iii.   Patient changing over to self medication or changing over to quacks

1.12 Drug Uses Pattern in Indonesia

Rational use of drugs at health centers remains a problem in Indonesia. Polypharmacy (3.5 drugs per patient), overuse of antibiotic (43 %), misuse and overuse of injections (10–80 %), short consulting time (3 minutes) and poor patient compliance are common patterns of irrational use of drugs in Indonesia. These cause inefficiency and ineffective use of a limited drug budget.

Successful interventions have been made to improve drug use in Indonesia, for example self-monitoring followed by feedback, in-service training combined with monitoring and supervision, and small group discussion. However, the Ministry of Health has not yet adopted most of these proven interventions, since these studies did not involve decision-makers especially at the central level. The other reasons are the decision-makers may be unaware about the results of these studies, the interventions might be expensive and the interventions might not be able to be built into the current system.

Considering the results of the studies, available resources and technical feasibility, I would like to recommend that the Ministry of Health should strengthen the capacity of personnel at district health offices and pharmaceutical warehouses so that they can train personnel at health centers on rational drug use as well as monitor and supervise drug use

at health centers. Self-monitoring method should be implemented in other places and prescribers should provide face-to-face education to patients based on printed education material at health centers. (Arustiyono 1999)

1.13 Patterns of Drug Use in Malaysia

The study was conducted in the primary health sector and it was reported that the average number of drugs prescribed per prescription was 2.79, average percentage of antibiotic used was 23.2% and the percentage of injection used was 1.7%. All of the drugs prescribed to patients were listed in the EDL. The average percentage of drugs adequately labeled was 92.0%. The percentage of patients who had adequate knowledge of how to take their drugs was 74.9%. The percentage of the public health clinics who kept the Standard Treatment Guidelines (STG) in their premises was 95.0%, but none kept the EDL in their premises. (Kamaruzaman 2006)

1.14 Prescription Pattern of Hypertensive Patient's in Bangladesh

A prescription survey was conducted from various hospitals of Bangladesh. It was reported that among total of 418 prescriptions, most patients (n=374; 89.28%) received more than one medicine per prescription; more than half (n=235; 56.22%) received three or more medicines. 15.07% (n=63) received 5 or more medicines. 5.74% (n=24) of prescriptions had no details of the duration of treatment. Most prescriptions were for a period of 7 days. Parenteral (injectable) preparations in 5.26% (n=22). The overwhelming majority of prescriptions (n=418; 100%) consisted entirely of branded medicines; in just over two-thirds of the prescriptions (n=672; 68.5%), the cheapest brand was used for at least one medicine. The prescribing practitioner's name and contact details were missing from more than a quarter of the prescriptions. Three-quarters of the prescriptions did not include the Medical Registration Number of the practitioner and less than half had the full name of the patient. The majority of the prescriptions did not have clear instructions for the patient on how to use the medicines prescribed. Among 418 prescriptions the

number of male is 195 and number of female is 223 suffering from hypertension associated with diabetes, high lipid profile, depression etc.The frequency of patient treating antihypertensive drugs is diuretics (n=16), ACE inhibitor (n=49), calcium channel blockers (n=8), ARB (n=18), beta-blocker (n=39), multiple (n=43), combination (n=5) and about 240 patients are treated only by verbal advice. The frequency of patient treated with glycerintrinitrates (n=62).The frequency of patient treated with vitamin (n=19), combination of mineral and vitamin (n=67), minerals (n=5). People with body weight of (61–80) kg mostly uses minerals and vitamins (n=26). People with (41-60) years of age mostly uses minerals and vitamins (n=42). Patient suffering from hypertension also has high lipid profile. Among 351 prescriptions, 65 contain atrovastatin as lipid lowering agent. No other drug is prescribed for this purpose. So atrovastatin is the only drug that is used for lowering the lipid level in Bangladesh. People from 41-61 years of age mostly use PPI. Most frequently used drug is omeprazole (n=73). Among 418 prescriptions the frequency of patient treating antiplatelet is aspirin (n=31), the combination of aspirin and clopdogrel (n=45), clopidogrel bisulphate (n=11). So we can say that the combination of aspirin and clopitogred are the mostly used as antiplatelet drug. Among 394 prescriptions 21 have bromazepam and two prescriptions have diazepam and one prescription has clonazepam. So it can be inferred that the patient are more sensitive to bromazepam. From the survey it is observed in a single patient the frequency of prescribing multiple prescriptions is high. Several prescriptions lack even the basic information such as the identity of the practitioner and patient. The clarity of instructions was inadequate for more than half of all prescriptions. Since a number of prescriptions were not dated, there is a potential of the same prescription being re-used for an indefinite period of time. (Shapna, 2010)
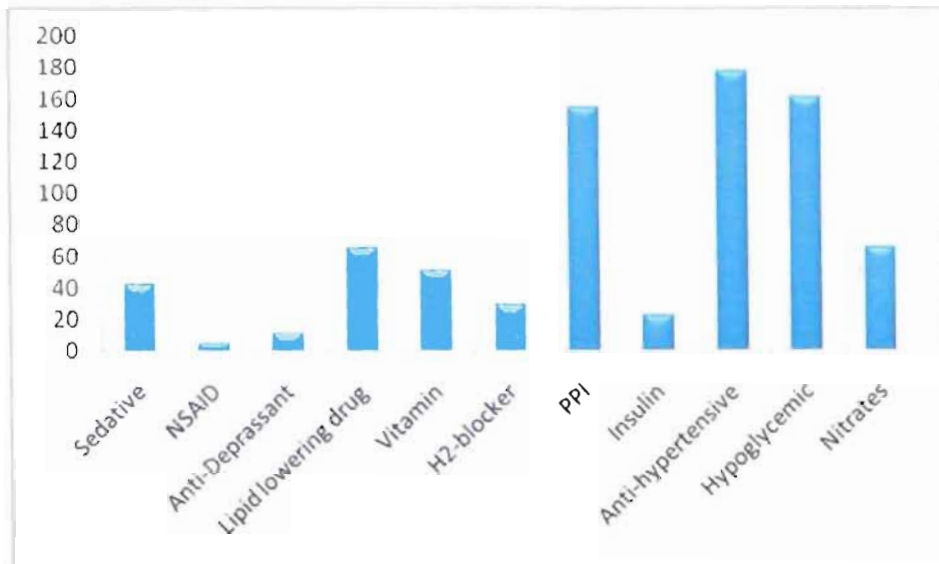
Figure 1.1: Percentage of different types of prescribed medicine.

Table 1.1: Layout, Legibility and clarity of prescriptions

Attribute studied	Frequency (n=418)
Letterhead used	283(67.70%)(+26.05% used a stamp)
Doctor's Name present	309(73.92%)
Qualification stated	298(71.29%)
Complete address stated	345(82.53%)
Telephone stated	252(60.28%)
Doctor's signature	397(94.97%)
Medical Registration Number stated	127(30.38%)
Date of consultation mentioned	342(81.81%)
Patient's full name stated	256(61.24%)
Patient's address stated	146(34.92%)
Legibility	387(92.85%)
Clarity of Dose	345(82.53%) has at least one medicine dose unclear
Clarity of Instructions	317(75.83%) had unclear instruction for use of at least one medicine

1.15 Rational Use of Drugs through Prescription Monitoring

In the demographic parameters, a total of 500 prescriptions study showed a positive improvement such as age (98.4 percent) and sex (97 percent), disease diagnosed (18 percent), and patients care indicators such as written (0.8 percent) and oral (80 percent) instructions given by pharmacists. Present study also demonstrated some change in indicators from the earlier prescribing pattern such as antihistamines, (20.5 percent) were highly prescribed among different categories of drugs, generic drugs (48.6 percent) vs. branded (51.4 percent), average drugs per prescription (2.1), tablet dosage form (68.2 percent) and average dispensing time (2.0 min). Study also strongly pointed out certain parameters that required a serious attention such as dose of the antibiotics and practice of fixed dose combination. The present findings suggest that sustained efforts are required to improve rational prescribing and dispensing practices, as considerable scope to improve further health status of patients as well as economic status of the health center existed (Kaushal A., 2003).

1.16 Prescribing Pattern in Surgical Wards

Irrational use of medicines is widespread throughout the world. The main problems include the unnecessary prescription of drugs, particularly antimicrobials and injections. To investigate the situation in surgery wards, the present study was undertaken. Ninety six prescriptions were collected prospectively from post-operative patients admitted in surgery wards of the JN Medical College Hospital, AMU, Aligarh, and subjected for analysis according to the WHO/INRUD Indicators. VEN method was also applied to ascertain quality of drug procurement. It was revealed that the proportion of drugs from Essential Medicines List (EML) was 61.4%, while no drug was prescribed by generic name. Groups of drugs most commonly prescribed by general surgeons were antibiotics (93%), analgesics (60%), antacids (43%) and antiemetics (10%). The most extensively prescribed drugs from each of the above groups were injections Ceftriaxone and Amikacin, tablets Voveron, Pantoprazole and Metoclopromide, respectively. The average number of drugs prescribed per patient and cost per day per prescription was 4.8 and

246.1 INR, respectively. Average number of antibiotics prescribed per prescription was 2.2 and the average number of injections per prescriptions was 2.3. The results showed that the pattern of drug prescribing is not based on WHO criteria for rational use of drugs. The system is not at all evidence-based. It is thus necessary to make surgeons aware about good prescribing habit by following 5 steps of the WHO Program on Rational use of Drugs (RUD).(Salman et al., 2008)
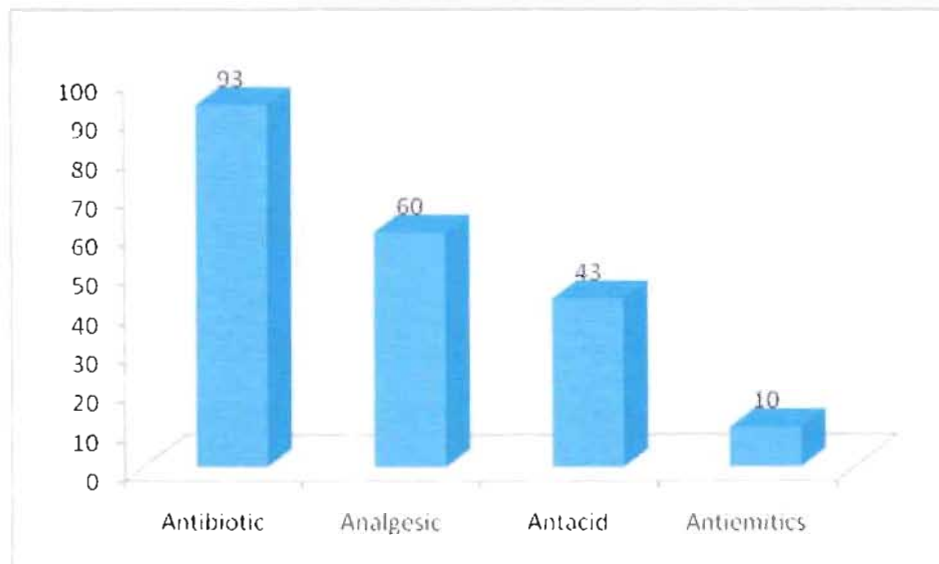

Figure 1.2: Percentage of different types of prescribed medicine.

1.17 Pattern of Rational Use of Drugs at Public Health Facilities in Laos

In Laos, the survey reported that among the 3 items of drugs prescribed per average encounter, 97% were dispensed from HFs, of which 67% were adequately labeled, 84% were on the national essential drug (ED) list, and 78% were prescribed by generic name. Seventy four percent of patients knew how to take the drugs they received, 47% of them received antibiotics (ABs), and 18% received injections. Forty-seven percent of under-five children with simple diarrhea received ABs, 77% received Oral Rehydration Salts (ORS) and 5% received anti-diarrhea drugs, and 91% of such under-five children with mid/moderate pneumonia received one of first line ABs, 15% received more than one ABs, and 41% of non-pneumonia (flu) patients of any age received ABs. (Bounxou 2006)

1.18 Prescribing Pattern of the Private Practitioners in Bangladesh

Undergradute students were reported by the study of prescribing pattern that there were average 3.81 drugs per prescriptions .Only in 5 prescriptions the drugs were prescribed in generic name; only 26.5% of prescriptions were complete in regard standard prescription format; only 50% drugs were prescribed from the essential drug list; only 17.5% of prescriptions were complete in respect to patient medical information. Antibiotics were prescribed in 72.5% of the prescriptions; injections were prescribed in about 12.1% of the prescriptions. (Zaida, 2006)

Table 1.2 : Results of Prescription Audit (n=100)

Prescribing indicators	Number
Average drug per prescription	3.81
Prescribed in generic name (%)	5 (0.008%)
Antibiotics prescribed (%)	435 (72.5%)
Injections prescribed (%)	73 (12.1 %)
Percentage of drugs prescribed from essential drug list	300 (50%)

1.19 Rational Use of Drugs by Prescribing Pattern in Rajasthan

In tertiary hospital, Rajasthan, a survey was conducted and superscription of all prescriptions found that along with patient name, age and sex, however patient address was found missing. In inscription, dosages form and frequency were 96.1% and 74% respectively of total drugs prescribed. Subscription was not available in 28 % of

prescriptions where as only verbal instructions to the patient were given. All prescriptions were signed by prescriber, but it lacks their identity. Legible prescription was 78%. Average drug per prescription was 2.9. Out of total drugs (3757), Generic medicines and essential drugs were 69.8% and 69.7%. Among the total drugs used in different categories 66% (2498) were contributed by major four groups (Antimicrobial 27%, NSAID 19%, GIT 13%, and vitamins/minerals 7 %). Diagnosis was not written in 28% (365) of prescriptions. Irrationality in prescribing was 39% (Manoj, 2010).

Table 1.3: Analysis of prescriptions

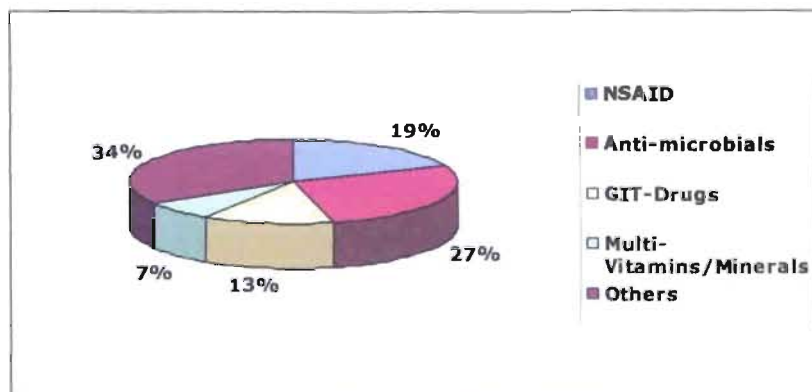| Title	Number
Number of prescriptions	1304
Total drugs prescribed	3757
Number of drugs prescribed by generic name.	2624 (69.8)
Total number of drug combinations prescribed	708 (18.8)
Drug combination from essential medicine list	228 (32.2)*
Total number of drugs approved by W.H.O (2007)	2620(69.7)

Figure 1.3: Percentage distribution of total drug used in different categories

CHAPTER : 02

METHODOLOGY

2.1. Objective

Medicines are one of the important basic needs for human being. But if it is used incorrectly it can damage our health rather hell our life's. Irrational use of drugs is the root cause of this factor and now this irrational of drug using is widespread in the world rapidly due to proper lack of knowledge.

The main objective of this study is to-

a) Identify magnitude and nature of inappropriate drug utilization and factors which influence the behavior of prescribers and patients.

b) Understand the adverse impacts of inappropriate use of drugs; describe factors which influence the decision-making process and specific medication use problems.

c) Find out the way of improving rational use of drug by following WHO pattern.

d) Create awareness among the Pharmacist to remember their most important roles on it to minimize the irrational use of drugs.

e) Engender awareness in the public and medical community regarding the Rational Use of Drugs, Essential Drugs Concept and promotion, marketing and safe use of medicines. Monitor good and bad effects of government policies regarding pharmaceuticals and the implementation of National Drug Policy.

f) To promote the "Rational use of medication" and "Essential drugs concept" in Bangladesh in order to optimize the usefulness of medicines and help bring equity in their access to promote rational prescription.

2.2 Study Protocol

The present study was designed to know the present situation about the Pattern of drug use, prescription writing and way of rational uses of drug. The study protocol consisted of the following steps:

a) Designing a questionnaire for survey
b) Selection of study area
c) Survey work
d) Data compilation
e) Statistical analysis of data and evaluation
f) Discussion
g) Conclusion

2.3 Rationale of the Work

The rational use of medicinal drugs is critical to the most important primary and preventive health care measures. At the same time, unless there is a regular supply of safe and effective drugs, public trust-and interest-in primary health care will rapidly deteriorate. Yet half the world's population lacks regular access to the most-needed medicines. Over the past decade, progress has been particularly difficult in the developing world because of adverse economic conditions and at the same ineffective legislation and regulations poorly coordinated drug policies and strategies, inefficient procurement, uneven distribution, unaffordable prices and inappropriate drug use. The more developed a country is, the more drugs it consumes. Of course the need for drugs in poor countries is just as great as, if not greater than, the need in the richer countries. The only difference is that the developing world lacks the finances to pay for the medicines it needs. WHO-through its Action Programme on Essential Drugs - began to provide technical and financial support to developing countries seeking to improve the availability and rational use of drugs. In addition to its operational work, the Action Programmes has played a major advocacy role in promoting the essential drugs concept as a tool to make the most of scarce resources, to improve health care, and to contribute

to greater social equity. At present 64 developing countries have operational essential drugs programmes, and another 28 are in the process of drawing up national programmes. Many other development and relief agencies now also apply the essential drugs concept to their health activities. Medically inappropriate and economically inefficient use of medicines is observed throughout the world. These features are more marked in the developing countries like Bangladesh. Rational use of medicines is one essential element to be achieved to improve quality of health and medical care for the patients and the community. Medical science in general and therapeutics in particular is developing very quickly and naturally undergoing fast transition. The prescription order is important therapeutic transaction between the clinician and the patient; prescription writing is a science and an art as it conveys the message from the prescriber to the patient. Rational use of drugs has multi- dimensional aspects which include medical, social and economical values. Medicines are to be used in an appropriate and safe way and only when needed. A policy on rational use of drugs is an extremely important part of a national drug policy. Its aim is to contribute to the health of the country's population by improving the use of medicines by health workers and consumers, and by encouraging the activities of government, industry and the media in support of rational drug use. In Bangladesh perspective, Doctors prescribe drugs where we know only the Pharmacist can do that. In our country there is no scope of Hospital (except 2/3 renewed private hospitals) and Retail Pharmacist. So Pharmacist has no scope to come in direct contact with the patients. Patients can buy medicine from the shops without prescription most of the time. The medicine provider never advises the patient about the appropriate use of drugs. Because they have lack of knowledge about the medicine information. This study is very much important to know the correct situation of drug use in Bangladesh. Medicines save life and treat diseases but misusage of drugs is harmful. When medicines are not used correctly, the social, economic and health cost can be high. There is widespread concern about the inappropriate use of medicines. Rational use of medications is essential for healthier community which makes this work rational.

2.4 Study Area

This study was conducted in Kotwalipara thana in Rangpur Districts under Rangpur division. A hospital and few clinics were chosen to do this work. The hospital is in the Rangpur city. The name of the hospital is Rangpur Medical College and it is 750 Seats General Hospital. The population of Rangpur city is approximately about 10 lacs. The number of doctors in this hospital is about 560 and most of them are M.B.B.S, some of them are F.C.P.S and F.R.C.S. This hospital has a diagnostic center with 24hrs doctors and ambulance service. This hospital provides health services to not only the population of Rangpur city but also to the majority population of the whole North Bengal.

2.5 Survey Method

The study was a cross-sectional survey of all prescriptions received from the patients over seven month's period. Prescriptions were collected by interviewing them. The layout of the prescriptions was assessed on the basis of the presence or otherwise of the following details: use of letterhead, information about prescribes person's qualifications, patient details. The content of prescriptions was assessed on the basis of drugs used (number of medications, duration of therapy, type of medications, whether generic names or brand names were used and if injectable medications were prescribed, if antibiotics, OTC drugs and vitamins are prescribed). Data was analyzed using Microsoft Excel Software and SPSS software. 91 prescriptions of patients were collected prospectively between January 2010 to July 2010. The survey was conducted to most of the in-patients. Some out patient data was also collected.

These were analyzed according to the WHO/INRUD prescription indicators for

a) Number of drugs per prescription,
b) Number of antibiotics per prescription,
c) Number of drugs prescribed by generic name.
d) Number of drugs prescribed from the WHO Model List of Essential Medicines (EML)
e) Number of injections per prescription.

Moreover, the commonly brand drugs, number of prescription drug were also looked into. Vital, Essential and Non-Essential (VEN) Method was also applied for the above study to ascertain the quality of drug procurement. This information was compiled, scored and analyzed using WHO guidelines.

CHAPTER : 03

DATA ANALYSIS
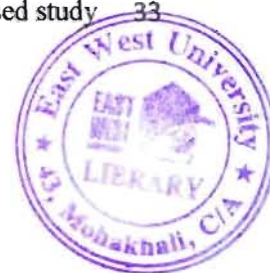
3. DATA ANALYSIS

3.1 Personal information

3.1.1Age: Patients who were enrolled in this survey showed the following distribution of age.

Table 3.1.1: Distribution of Age

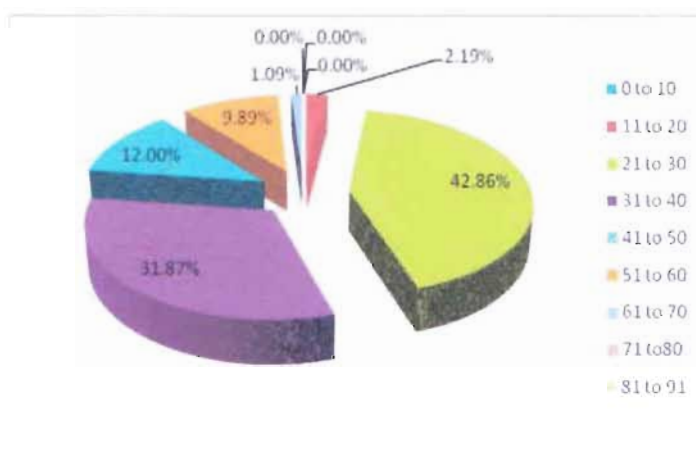| Age(Area)	Number	Population (%)
0 to 10	00	0.000%
11 to 20	02	02.19%
21 to 30	39	42.86%
31 to 40	29	31.87%
41 to 50	11	12.00%
51 to 60	09	09.89%
61 to 70	01	01.09%
71 to80	00	0.000%
81 to 91	00	0.000%

Figure 3.1.1: Distribution of Age

3.1.2 Living area: Patients who were enrolled in this survey showed the following distribution of living area.

Table 3.1.2: Distribution of Living Area

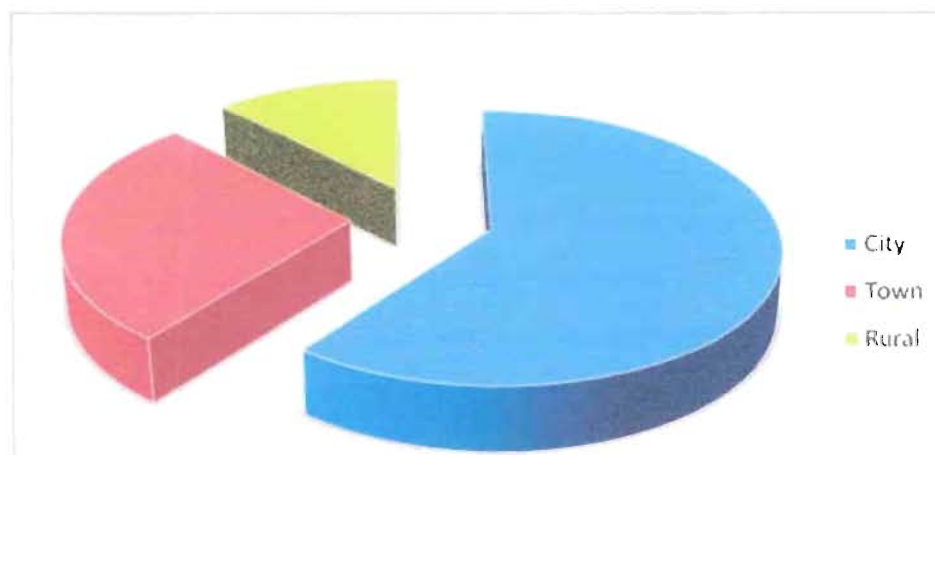| Living Area	Number	Population (%)
City	55	60.44%
Town	25	27.47%
Rural	11	12.09%

Figure 3.1.2: Distribution of Living Area

3.1.3 Gender: Patients who were enrolled in this survey showed the following distribution of sex.

Table 3.1.3: Distribution of Gender

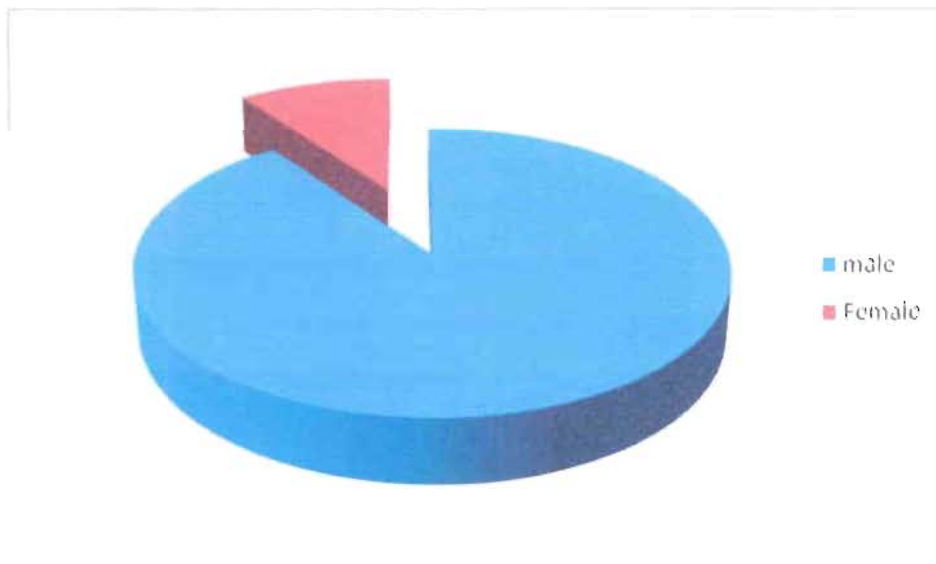| Gender	Number	Population (%)
Male	82	90.11%
Female	09	09.89%

Figure 3.1.3: Distribution of Gender

3.1.4 Weight: Patients who were enrolled in this survey showed the following distribution of weight.

Table 3.1.4: Distribution of Weight

Weight (kg)	Number	Population (%)
0 to 20	00	0.000%
21 to 40	00	0.000%
41 to 60	47	51.64%
61 to 80	40	43.96%
81 to 100	04	004.4%

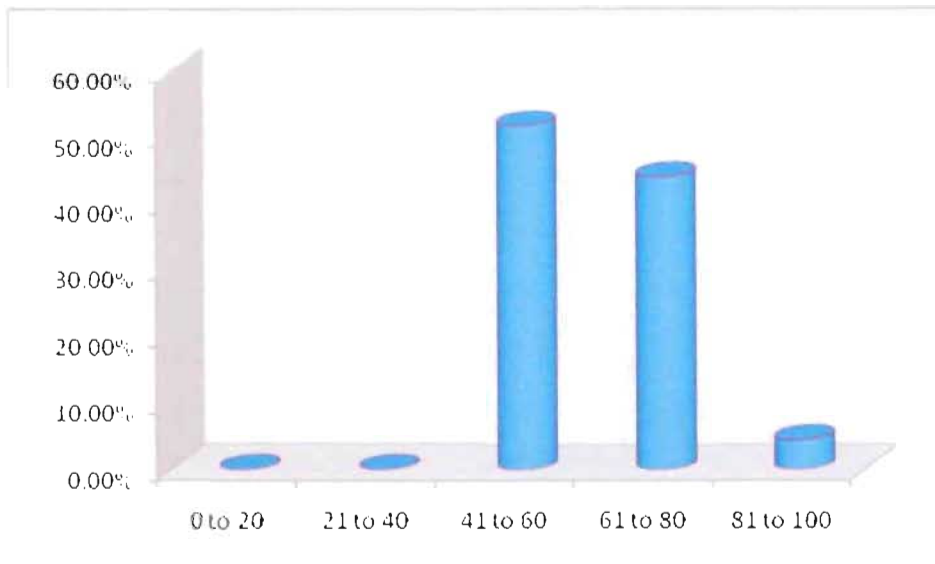
Figure 3.1.4: Distribution of Weight

3.1.5 Education : Patients who were enrolled in this survey showed the following distribution of education.

Table 3.1.5: Distribution of Education Level

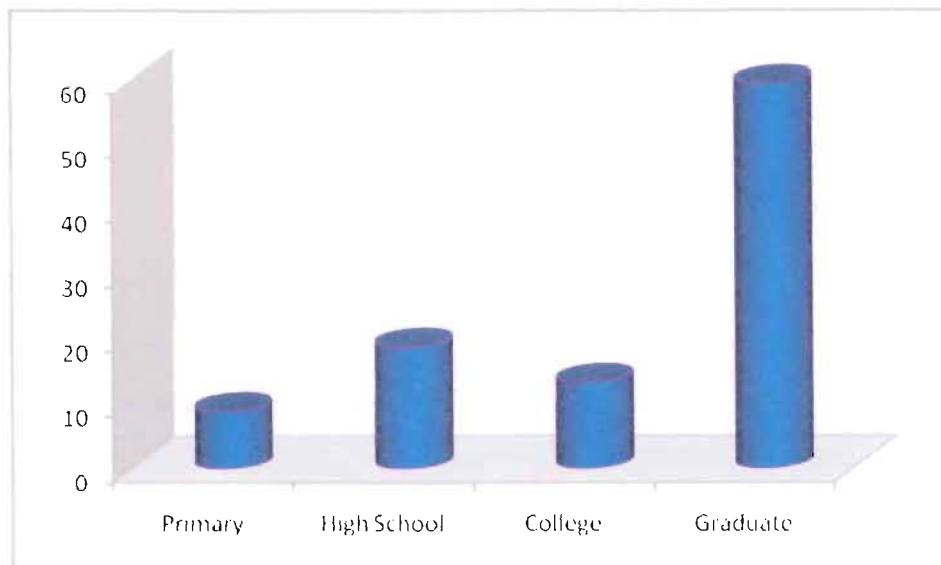| Education	Number	Population (%)
Primary	08	08.79%
High School	17	18.68%
College	12	13.19%
Graduate	54	59.34%

Figure 3.1.5: Distribution of Education Level

3.1.6 Occupation: Patients who were enrolled in this survey showed the following distribution of occupation.

Table 3.1.6: Distribution of Occupation

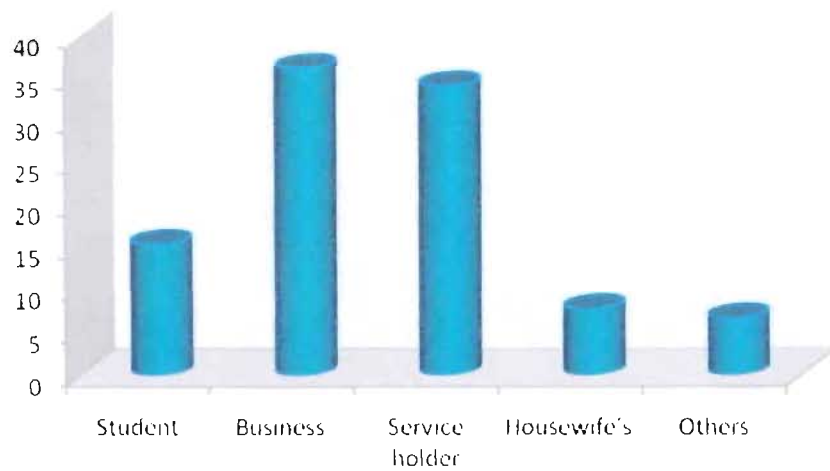| Occupation	Number	Population (%)
Student	14	15.38%
Business	33	36.26%
Service holder	31	34.08%
Housewife's	07	07.69%
Others	06	06.59%

Figure 3.1.6: Distribution of Occupation

3.2 Prescription information:

All the data in prescription are respectively shown below by graphical representation.

3.2.1. Drug Prescribed by Generic name Vs Brand name per prescription

Table 3.2.1: Generic name Vs Brand name per prescription

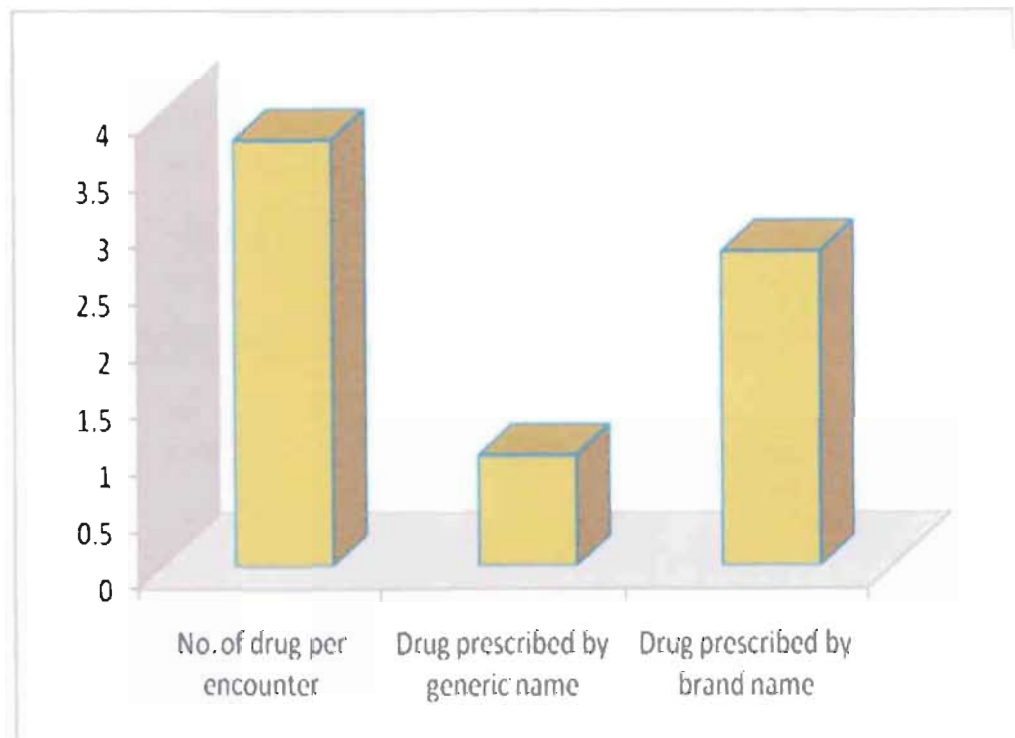| Drug detail per prescription	Average Number
No. of drugs	3.747
Drug prescribed by generic name	0.978
Drug prescribed by brand name	2.769

Figure 3.2.1: Average no. of drugs per prescription

3.2.2. Injection & other dosage form per prescription

Table 3.2.2: Average no. of injection & other dosage form per prescription

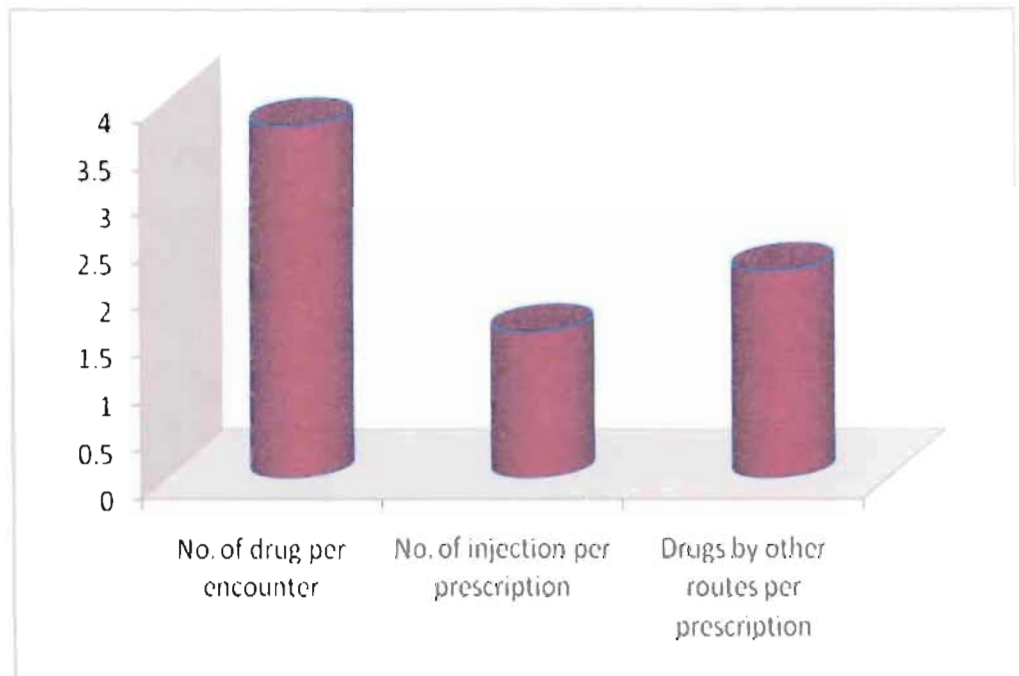| Drug detail per prescription	Average Number
No. of drugs	3.747
No. of injection	1.549
No. of other dosage forms	2.198

Figure 3.2.2: Average no. of injection & other dosage form

3.2.3. Antibiotics & Vitamins used per prescription

Table 3.2.3: Antibiotics & Vitamins

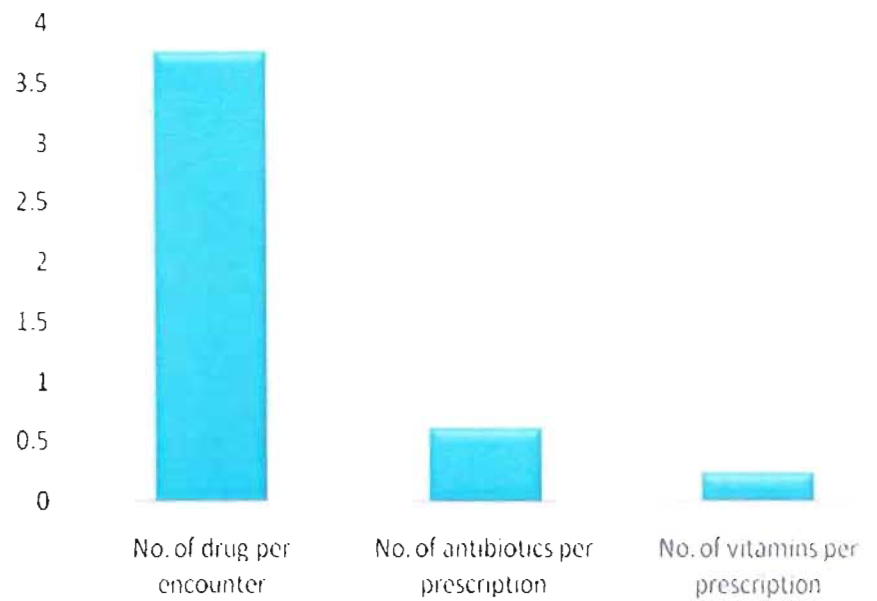| Drug detail per prescription	Average Number
No. of drugs	3.747
No. of antibiotics	0.593
No. of vitamins	0.230

Figure 3.2.3: average no. of Antibiotics & Vitamins per prescription

3.2.4. Essential drugs used per prescription

Table 3.2.4: Essential drugs used

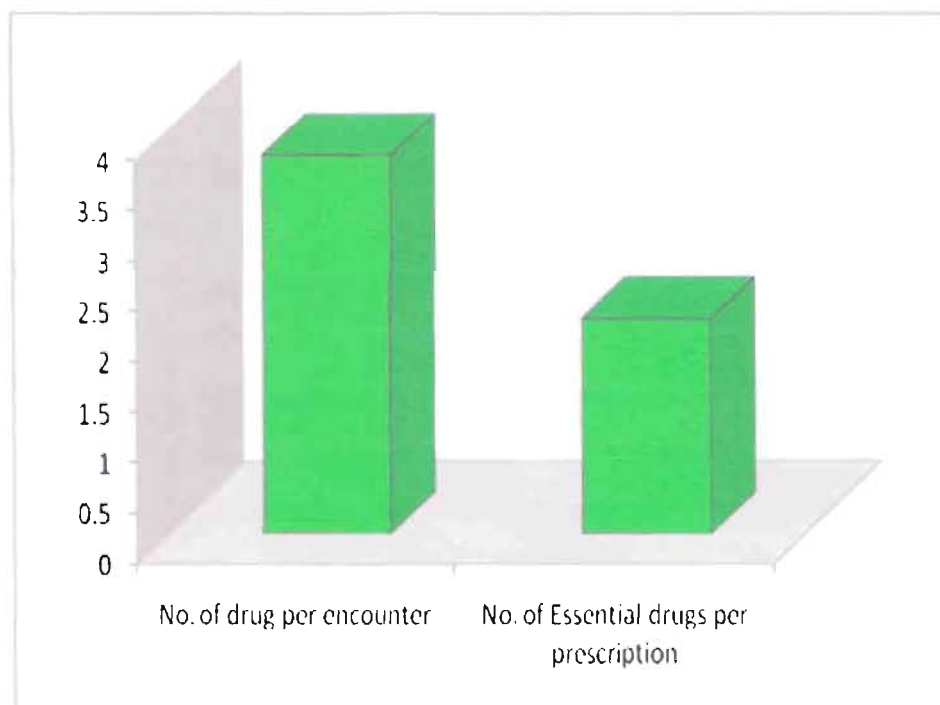| Drug detail per prescription	Average Number
No. of drugs	3.747
No. of Essential drugs	2.121

Figure 3.2.4: Average no. of Essential drugs used

3.2.5. OTC drugs & Prescription drugs used per prescription

Table 3.2.5: OTC drugs & Prescription drugs used

Drug detail per encounter	Average Number
Number of drugs	3.747
OTC drugs	0.813
Prescription drugs	2.582
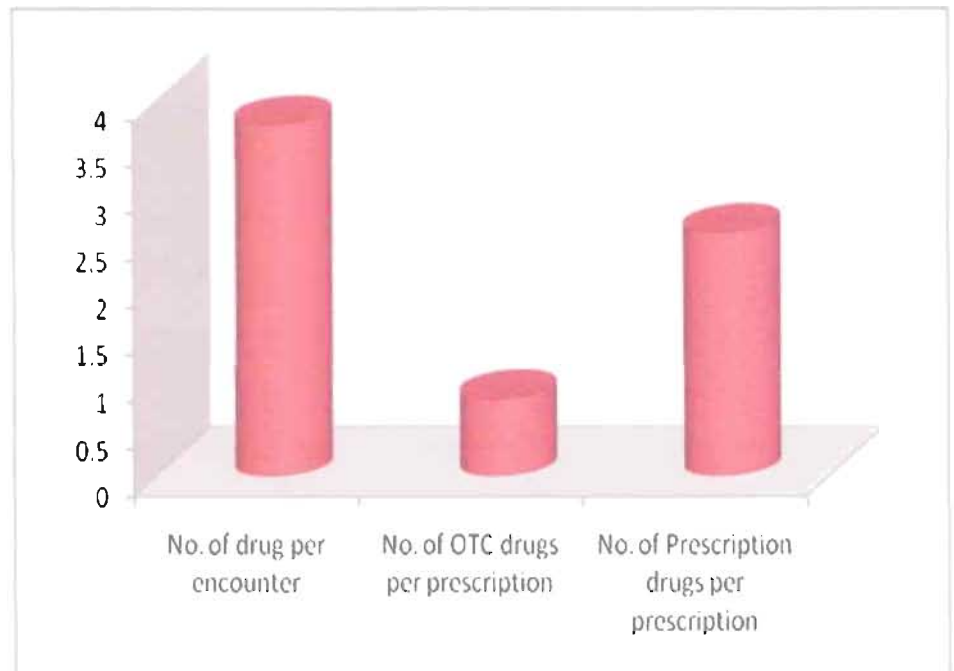
Figure 3.2.5: Average no. of OTC drugs & Prescription drugs

3.2.6. Percentage of all kinds of drugs used:

Table 3.2.6: Percentage of all kinds of drugs

Generic Name	Brand Name	Antibiotics	Injections	Essential Drugs	OTC Drugs	Prescription Drugs	Vitamin
89	252	54	141	193	74	235	21
8.396%	23.773%	5.094%	13.301%	18.207%	6.981%	22.169%	1.981%

Chapter: 04
Result &
discussion

4. RESULT and DISCUSSION

During this study period, 91 prescriptions were surveyed. The average age of the volunteers was found 33.05 years. Among 91 volunteers, 42.86% patients were found between the ages of 21-30 years. The average weight of the volunteers was 35.01 kg. 51.64% volunteers were found between the weights of 41-60 kg. Among 91 volunteers, 9.89% were female volunteers and 90.11% were male volunteers. 12.09% volunteers were from rural areas and where 27.47% volunteers were from town areas and 60.44% are from city areas. Educational statuses of volunteers were like primary level 8.79%, high school level 18.68%, College level 13.19%, and Graduate level 59.34%. Among 91 volunteers, students (15.38%), businessman (36.26%), housewives (7.69%), service holder (34.08%) were found.

It was found by this study that among 91 prescriptions, total number of drugs was 341 and average 3.7362 drugs were prescribed per encounter. A study from Indonesia (3.5 drugs per patient) (Arustiyono, 1999), Malaysia (average 2.79 drugs per prescription). [Kamaruzaman S.et.al, 2006], North India (average 4.8) (Salman MT.et.al,2008), Bangladesh [more than half (n=235; 56.22%) received three or more medicines,15.07% (n=63) received 5 or more medicines] (Shapna .et.al,2010) was reported as polypharmacy.

In this study, the average number of drugs prescribed per encounter by Generic name was 0.978 and the average number of drugs prescribed per encounter by Brand name was 2.769. Generic name of drug is used as prescription indicators by WHO. Drugs must be prescribed by generic name. But in this study mispromotion was occurred.

The average number of Prescriptions drugs prescribed per encounter was 2.5824 where the average number of over the counter drugs prescribed per encounter was 0.8131. OTC denotes Over the Counter Drugs which needs no prescription to be prescribed.

In this study, the average number of Essential drugs prescribed per encounter was 2.121.That means no. drugs were prescribed from the essential drug list. Essential drugs are used as prescription indicators by WHO.

The average number of Antibiotics prescribed per encounter was 0.5934. The uses of Antibiotics drugs are more sensitive than any other drugs prescribed in this study. Antibiotics drugs are used as prescription indicators by WHO.A study from Indonesia (43 % of antibiotics used), (Arustiyono, 1999), Malaysia (average percentage of antibiotic used was 23.2%),(Kamaruzaman S. et.al, 2006), North India (antibiotics per prescription was 2.3) (Salman MT,et.al,200) was reported as overuse of antibiotics. Overuse or unnecessary antibiotics drugs prescribed leads to irrational use of Drugs.

The average number of Vitamins prescribed per encounter was 0.2307. Vitamins need not be included in a prescription to be prescribed.

The average number of Injections prescribed per encounter was 1.5494. Injections are given by IM or IV.Using too many injections may cause severe damage to our skins. Injections are used as prescription indicators by WHO. A survey about injections used in Indonesia (10–80 %) (Arustiyono, 1999), Malaysia (1.7%) (Kamaruzaman S. et.al, 2006) and North India (2.3±2.1 per encounter) (Salman MT, et.al, 2008) was reported as irrational use of Drugs.

The Above study, it was clear that the prescribers didn't follow the WHO guidelines for drug prescribed pattern which leads to increase the irrational use of drugs.

Chapter: 05
Conclusion

5. CONCLUSION

Medicines are to be used in an appropriate and safe way and only when needed. Drug use is the end of the therapeutic consultation. Ensuring that the correct drug is given to the correct patient is a high priority for all health professionals. This study highlights the continuing crisis of irrational drug prescribing pattern in Bangladesh. This survey result was compared with other previous survey results about "Rational use of drugs" of different countries and it was evident that the prescribing pattern was not rational regarding some particular parameters like polypharmacy, Brand prescribing, non-essential drugs, overuse of antibiotics, use of injection, overuse of vitamins. So, the prescribing practices and the use of drugs are not satisfactory. Irrational prescribing is a habit that is difficult to cure. However, prevention is possible. The results suggest a need for intervention to curb the irrational use of drugs in prescribing for improving rational use of drugs.

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Appendix

Questionnaire: Cross-sectional survey method pattern is followed here.

East West University

Department of Pharmacy

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Rational Use of Drug in Rangpur- A Prescription Based Study

(A Project Report to Be Submitted in the Department of Pharmacy for the Partial Fulfillment of the Degree of Bachelor of Pharmacy)

Date: **Report no:**

Personal Information

1. Name

2. Age

3. Gender: Female   Male

4. Height:

5. Weight

6. Living area: ☐ City   ☐ Town   ☐ Rural

7. Education: ☐ Primary   ☐ High School

☐ College   ☐ Graduate school

8. Occupation: ☐ Student   ☐ Business

☐ Service holder   ☐ Housewife

☐ Others

9. Monthly income

10. If student then guardian's income

Prescribing Indicators

11. Name of drugs prescribed

A ....   D...........................

B................................   E...........................

C...............................   F...........................

12. Number of drugs per encounter

13. Number of drugs prescribed by generic name

14. Number of drugs prescribed by brand name

15. Encounter with an antibiotic prescribed

☐ Yes

☐ No

16. Number of antibiotics per encounter

[ ]

17. Encounter with an injection prescribed

☐ Yes

☐ No

18. Number of drugs prescribed from essential drug list

[ ]

19. Number of drugs prescribed from OTC drug list

[ ]

20. Number of Prescription drugs per encounter

[ ]

21. Number of Vitamins per encounter

[ ]

Patient Care Indicators

22. Consultation time

[ ]

23. Dispensing time

[ ]

24. Numbers of drugs actually dispensed

[ ]

25. Numbers of drugs adequately labeled

[ ]

26. Does patient know about the dosage schedule?

Yes

Health Facility Indicators

27. Name:

28. Location:
☐ City

☐ Town

☐ Rural

29. Seats:

30. Type:
☐ General hospital

☐ Specialized hospita

☐ Community hospita

31. Availability of key drugs in hospital
☐ Yes

☐ No

32. Availability of essential drugs list in hospital
☐ Yes

☐ No

Complementary Drug Use Indicators

33. Drug cost per day in BDT

34. Drug costs spent on antibiotic in BDT

35. Drug costs spent on injection in BDT

36. Are patients satisfied with care they received?

☐ Yes

☐ No

_____

Signature of Responder

_____

Signature of Interviewer