Rational Use of Drugs-In Kalkini Upazila, Madaripur
A Prescription Based Study

A Project report submitted to the Department of Pharmacy, East West University in partial fulfillment for the Degree of Bachelor of Pharmacy

Submitted by

Syed Zahirul Islam

ID# 2006-2-70-087

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Department of Pharmacy

East West University

This research paper is dedicated to my Beloved parents

CERTIFICATE

This is to certify that the thesis entitled "Rational Use of Drug in Kalkini upazila- A Prescription Based Study" submitted by me to the Department of Pharmacy, East West University for the requirement of award of the degree of Bachelor of Pharmacy (Honors) is a bonafide record of research work carried out by Syed Zahirul Islam (2006-2-70-087) under the supervision of Farhan Rizwan Senior Lecturer, Department of Pharmacy, East West University. The contents of this thesis paper, in full or in parts, have not been submitted to any others Institute or University for the award of any degree or diploma.

Dr. Sufia Islam
Chairperson& Associate Professor
Department of Pharmacy
East West University

CERTIFICATE

This is to certify that the thesis "Rational use of Drugs- in kalkini upazila a Prescription Based Study" 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 Syed zahirul islam (2006-2-70-105) under our guidance and supervision and that 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.

Farhana Rizwan
Supervisor & Senior Lecturer
Department of Pharmacy
East West University
Mohakhali, Dhaka

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Abstracts

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. The main objective of this study is to promote the "Rational use of medication" 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 prescribes 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 at Kalkini Upazila in Madaripur District under Dhaka division. One hospital was chosen to do this work. Patient based prescription Survey was conducted and Fifty five prescriptions of patients were collected prospectively between September and December 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 & INRUD indicators. In this study, it was found that the average number of drugs was 4.25±1.54 prescribed per encounter , the average number of drugs prescribed by Generic name was 0.127± 0.33 per encounter, the average number of drugs prescribed in Brand name was 4.12± 1.65, the average number of Prescriptions drugs was 1.36±.75 prescribed per encounter, the average number of OTC drugs was 2.56±1.11 prescribed per encounter, the average number of Essential drugs was .61±.78 prescribed per encounter, the average number of Antibiotics was 1±0.66 prescribed per encounter, the average number of Injections was 0.48±.48 prescribed per encounter, the average of Vitamins was 0.127 ±0.38 prescribed per encounter, average consulting time 2.9 (min) & average dispensing time was 3.3 (min). The adequately labeled drug was average 3.38 and this survey also shows that only 36% patients know about the drug dosing schedule and 64% patients don't know about dosage schedule. It was obvious that the prescribing pattern was not rational regarding some particular parameters. Ensuring that the correct drug is given to the appropriate patient should be a high priority for all health professionals.

CHAPTER: ONE

INTRODUCTION

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. Prescription audit shows the way towards writing rational prescriptions. Rational use of drugs has multi- dimensional aspects which include medical, social and economical values; 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. [1]

Ineffective inappropriate and economically nonviable use of medicines is often observed in health care throughout the world. This is more often in the developing countries. The need for achieving quality use of medicines in the healthcare system is not only because of the financial reasons with which policy makers and administrators are usually most concerned. Appropriate use of drugs is also one essential element in achieving quality of health and medical care for patients and the community as a whole. [1]

A major global problem

Irrational use of medicines is a major problem worldwide. WHO estimates that more than half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take them correctly the overuse, under use or misuse of medicines results in wastage of scarce resources and widespread health hazards, Examples of irrational use of medicines include: use of too many medicines per patient (poly-pharmacy); inappropriate use of antimicrobials, often in inadequate dosage, for non-bacterial infections; over-use of injections when oral formulations would be more appropriate; failure to prescribe in accordance with clinical guidelines; inappropriate self-medication, often of prescription-only medicines; non-adherence to dosing regimes.[2]

1.1 Intervention Research in Rational Use of Drugs: A Review

Many studies have been done to documented drug use patterns, and indicate that over prescribing, multi-drug prescribing, misuse of drugs, use of unnecessary expensive drugs and overuse of antibiotics and injections are the most common problems of irrational drug use by prescribers as well as consumers. Improving drug use would have important financial and public health benefits. Many efforts have been undertaken to improve drug use, but few evaluations have been done in this field. This article provides an overview of 55 intervention studies to improve drug use in developing countries. It highlights what type of interventions exists and what is known about their impact. It reveals that commonly used interventions, such as an essential drug list and standard treatment guidelines, have rarely been systematically evaluated so far. The majority of intervention studies are focused on prescribers in a public health setting, while irrational use of drugs is also widespread in the private sector. Furthermore, the magnitude of inappropriate drug use at community level is often overlooked and few interventions address drug use from a consumer's perspective. More research on different types of intervention strategies in various health care settings is needed to draw conclusions on the effectiveness of a specific intervention strategy. Also more research is needed on socio-cultural factors influencing the impact of drug use interventions, particularly from a user perspective. To enhance evaluative research, more technical support will be needed for researchers in developing countries. The design of available studies from developing countries is generally weak, only six of the 55 studies included in this overview were randomized controlled studies. In order to provide technical support and coordination of future intervention research the establishment of an international resource centre for drug use intervention research is recommended. [3]

1.2 Rational Use of Medicines

WHO defined rational use of drug as "*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, and the lowest cost to them and their community.*" (WHO, 1985)

In other words we should ensure that there is:

- Appropriate indication. The decision to prescribe drug(s) is entirely based on medical rationale and that drug therapy is an effective and safe treatment
- Appropriate drug. The selection of drugs is based on efficacy, safety, suitability and cost considerations.
- Appropriate patient. No contra-indications exist and the likelihood of adverse reactions is minimal, and the drug is acceptable to the patient.
- Appropriate information. Patients should be provided with relevant, accurate, important and clear information regarding his or her condition and the medication(s) that are prescribed.
- Appropriate monitoring. The anticipated and unexpected effects of medications should be appropriately monitored.

Common Problems

- The number of drugs per prescription is often more than needed, with an average of 2.4 up to 10 drugs, while generally one or two drugs should be sufficient.
- Wrong drug for a specific condition.
- Drugs of doubtful efficacy.
- Drugs of uncertain safety status.
- Use of drugs in wrong dosage and duration.

A study recently published in BMJ (June 10,2006) found that even some cases of pneumonia a potentially life-threatening disease could be treated with a three-day course of antibiotics, rather than the conventional 7- to 10-day treatment. In light of this we have to justify if we prescribe for more than 3 days in dental problems. In a study done at a dental school it was found that most of Mindless prescriptions cause great harm to patients in long term. Painkillers can produce long lasting gastric problems. Antibiotics disturb the delicate balance of bacterial flora of GI tract and this can have far reaching consequence on patient's general wellbeing and long life. In case of analgesics we need to know which one will be appropriate for patients needs so that he will get relief from his pain. In case of antibiotics we should choose a proper antibiotic which will take

care of his condition and assist his body in early resolution of his ailment. We should also know exactly in which circumstances/ medical conditions preventive prophylactic cover is needed. In next part of the article we shall see what the guidelines that should dictate our prescriptions are. [4]

1.2.1. 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. In Bangladesh this can therefore be a complex with multiple cultures, religions, dialects and castes. If one were to broadly classify the factors, they could be divided in to: those deriving from patients, chemists shop, prescribers, the workplace the supply system, industry influences, regulation, drug information and misinformation. [1]

In each group, there can be various ways contributing to irrational use of drugs:

- Patients: drug misinformation, misleading beliefs, patient demands / expectations.
- Prescribers: lack of education and training, inappropriate role models, patient pressures, lack of objective drug information, company incentives, limited experience, misleading beliefs about drug efficacy, competition.
- Workplace: heavy patient load, pressure to prescribe, lack of adequate lab capacity, insufficient staffing.
- Drug Supply System: unreliable suppliers drug shortages, limited budgets necessitating fixed choices, expired drug supplied.
- Chemists Shops: patient pressures, profit motives, competition.
- Drug Regulation: non-essential drugs available, inefficient audit system, inadequate legal implementation, and no-formal procedures.
- Industry: promotional activities, misleading claims, incentives[1]

1.2.2 Impact of Irrational drug Use

Irrational drug use can have various consequences, for the patient, the public, the health system and even the economy. A few important consequences are mentioned below:

- ❖ Reduction in the quality of drug therapy- this can lead to increased morbidity and mortality.
- ❖ Waste of resources- This can lead to reduced availability of other vital drugs and increased costs.
- ❖ Increased risk of unwanted effects- Adverse drug reactions and the emergence of drug resistances.
- ❖ Psychosocial impacts-patients may believe that there is a pill for every ill. [1]

1.2.3 A focused case of irrational drug use and its consequence- the antimicrobial misuse problem

The problem of antimicrobial resistance was one of the important issues brought up at the world health assembly (WHA) in 2005. According to WHO antimicrobial resistance is one of the world's most serious public health problems. A major reason is the irrational use of medicines According to WHO, worldwide, more than 50% of all medicines are prescribed, dispensed or sold inappropriately and 50% of patients fail to take them correctly. The consequence of this is seen directly with the misuse of antibiotics. There is increasing antimicrobial resistance, with resistance of up to 70-90 % to original first line antibiotics for dysentery (shigella), pneumonia (Pneumococcal), gonorrhea, and hospital infections (Staph. Aureus). It has been shown in WHO policy paper on "Containing antimicrobial resistance" says that many of the microbes that cause infectious disease no longer respond to common antimicrobial drugs such as antibiotics, antiviral and antiprotozoal drugs. The problem has reached unprecedented proportions that unless concerted action is taken worldwide; we run the risk of returning to the preantibiotic era when many more children than now died of infectious diseases and major surgery was impossible due to the risk of infection. In Fourteenth model list of essential medicines supplied by WHO (March 2005) contains only 18 approved drug combinations, whereas in India, there are

innumerable examples of irrational drug combinations, which are available and can be bought without necessarily giving a prescription. [1]

1.2.4 Some irrational fixed dose combinations available in the Indian Market

Sr. No.	Combinations	Irrationality
1	Norfloxacin+Metronidazole;Norfloxacin+Tindazole; Norfloxacin+tindazole+Loperamide; Norfloxacin+Tinidazole+Dicycloamine; Norfloxacin+Ornidazole;Ciprofloxacin+Tinidazole; ofloxacin+Tinidazole;Ofloxacin+Metronidazole; Ofloxacin+Ornidazole; Gatifolxacin+Ornidazole.	Though claimed to be broad spectrum, combiningwith fluroquinolone (is irrational because patient suffers only from one type of diarrhea. Using this combination adds to cost, adverse effects ad may encourage resistance.
2	Nimesulide+Diclofenac; Nimesulide+Dicycloamine+Simethicone; Nimesulide+Paracetamol;Nimesulide+Cetrizine+Pseudophedrine; Nimesulide + Paracetamol+ Tizanidine.	Nimesulide is a controversial drug, has been banned in many countries. It is a sorry state of affairs that its combinations are readily available over the counter. Combining two NSAIDs may increase the side effects of both the NSAIDs. There is little documentary, evidence that a preparation containing more than one analgesic is more effective than a single ingredient preparation.

Amoxycillin+ Cloxacillin.	Amoxycillin is inactiveagainst staphylococcus as most strains produce β lactamase and cloxacillin is not so active against streptococci. For any given, infection, one of the components is useless but adds to cost and adverse effect. Since amount of each drug is halved, efficacy is reduced and chances of selecting strains are increased.
Domperidine+Rabeprazole; Domperidone + Esomeprazole.	Increased incidence of rhabdomyolysis
Simvastatin+Nicotinic acid; Atrovastatin + Nicotinic acid	Probability of myopathy is increased
Enalpril+ Losartan.	Combining two drugs affecting the same pathway is irrational ; it doesn't add to efficacy
Diazepam+Dried aluminum hydroxide gel +aluminum glycinate + oxyphenonium; Diazepam+ Magaldrate + Oxyphenonium; Diazepam+ Dried alumininum hydroxide gel + magnesium trisilicate+ Dimethylpolysiloxane.	Antacids raise the gastric pH and reduce the absorption of benzodiazepines
Cetrizine+Phenylpropanolamine + Dextromethorpan; Cetrizine+Phenylpropanolamine+Paracetamol; Levocetrizine+Paracetamol+ Phenylpropanolamine.	Phenylpropanolamine is banned drug; yet it's a part of many cold remedies. Besides its potential to cause stroke (more so in hypertensive), it can aggravate diabetes, glaucoma and prostate enlargement.

1.2.5 Steps needs to be taken

Today, rational use of drug is an issue of the at most importance. The growing concern is not only for promotion of appropriate use of pharmaceuticals in the health care delivery and its economic considerations but also to provide health related quality of life (HRQL) for a community. The hit and trial method of combining drugs should be replaced by a rational and logical basis for bringing out a fixed dose drug formulation. Operational, statistical and mathematical models constitute a highly versatile framework for mechanism based modeling (pharmacokinetic/ pharmacodynamic) by taking signal transduction properties of the drug combination into account. Sound scientific research should underline the development and production of drug combinations. There is a need to carefully monitor and censor misleading claims by the pharmaceutical industry. Some degree of irresponsibility on the part of the pharmaceutical industry and lack of vigilance of government agencies underlies the increased popularity of irrational drug combinations. Most advertisements in many of the medical journals published from India fail to mention important details pertaining to correct usage of drug combinations. Clinical pharmacist can play an important role in guiding and imparting knowledge to the public. There is a need to strengthen the mechanism for continuing professional development of practitioners to ensure that they have the necessary knowledge and skills to prescribe rationally. The prescribers especially those in private practice should undergo a continuing medical education (CME) course once in year on newer combinations, new drug molecules introduced in to market and adverse drug reaction will go to a long way in curbing irrational prescribing. Adverse drug reactions (ADR) reporting should be made mandatory as they are in developed countries. Pharmacovigilance should be more effective. Hospitals should constitute drugs and therapeutics review committee to rationalize prescribing. Finally, medical schools and postgraduate colleges must take the responsibility of training students and young doctors how to assess new drug combinations more logically. Unless we encourage our students to think rationally and independently this menace will continue to grow. The effective interventions for improving rational use of drugs can be expected from all the members of the health care delivery team. There also needs a political will from decision makers so that these interventions are likely to be implemented on a countrywide basis so as to uplift the medical and all allied paramedical professions. The steps taken in this direction will be helpful to reduce

morbidity and mortality rate associated with the drug use. It also will improve the allocation of the resources leading for better availability of necessary drugs with proper costs. At the receiving drug end, patients will be benefited with decreased risk of unwanted affects such as adverse drug reactions and the mergence of drug resistance. Promoting the rational use of drugs will finally results in improved quality, increased accessibility and better quality of life for the community.[1]

1.3.1 Reasons for Irrational Use of Drugs

- Lack of information:-

Unlike many developed countries we don't have regular facility which provides us up to date unbiased information on the currently used drugs. Majority of our practitioners rely on medical representatives. There are differences between pharmaceutical concern & the drug regulatory authorities in the interpretation of the data related to indications & safety of drugs.

- Poor communication between health professional & patient:-

Medical practitioners & other health professional are giving less time to the patient & not explaining some basic information about the use of drugs.

- Promotional activities of pharmaceutical industries:

The lucrative promotional programmes of the various pharmaceutical industries influence the drug prescribing.

- Faulty & inadequate training & education of medical graduates: -

Lack of proper clinical training regarding writing a prescription during training period, dependency on diagnostic aid, rather then clinical diagnosis, is increasing day by day in doctors.

- Lack of diagnostic facilities/Uncertainty of diagnosis:-

Correct diagnosis is an important step toward rational drug therapy. Doctors posted in remote areas have to face a lot of difficulty in reaching to a precise diagnosis due to non availability of diagnostic facilities. This promotes poly-pharmacy.

- Demand from the patient:-

To satisfy the patient expectations and demand of quick relief, clinician prescribe drug for every single complaint. Also, there is a belief that "every ill has a pill" All these increase the tendency of polypharmacy.

- Defective drug supply system & ineffective drug regulation:-

Absence of well organized drug regulatory authority & presence of large number of drugs in the market leads to irrational use of drugs. [5]

1.3.2 Obstacles Exist In Rational Drug Use

Various obstacles in rational drug use are:-

- Lack of objective information & of continuing education & training in pharmacology.
- Lack of well organized drug regulatory authority & supply of drugs.
- Presence of large number of drugs in the market & the lucrative methods of promotion of drugs employed by pharmaceutical industries.
- The prevalent belief that every ill has a pill.[5]

1.4 Steps to Improve Rational Drug Prescribing

Step: - I

Identify the patient's problem based on symptoms & recognize the need for action.

Step:-II

Diagnosis of the disease Identify underlying cause & motivating factors. This may be specific as in infectious disease or non specific.

Step:-III

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.

Step:-IV

Start the treatment by writing an accurate & complete prescription e.g. name of drugs with dosage forms, dosage schedule & total duration of the treatment.

Step:-V

Give the proper information instruction & warning regarding the treatment given e.g. side effects (ADR), dosage schedule & dangers/risk of stopping the therapy suddenly.

Step:-VI

Monitor the treatment to check, if the particular treatment has solved the patient's problem. It may be:

- 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

- Active monitoring done by physician and he make an appointment to check the response of the treatment.

Indiscriminate use of drugs not only wastes scarce resources that could otherwise be spent on other essential services, but also leads to drug induced disease. The drug control authority, the teaching institutes, drug industries, N.G.O & the patient himself may be helpful for rational drug use. Drug authority must circulate the list of essential drugs which could be updated from time to time. It must monitor the safe & proper use of these drugs & enforce a uniform regulation for promotional literature. Teaching institute must conduct regular research work & proper training of undergraduates & post graduates. Motivation of NGO to organize various programmes for public awareness lastly, the patient himself should observe strict compliance to the physician' prescription & never indulge in self medication.

To conclude, the demands of rational drug use are:-

- Availability of essential & life saving drugs and unbiased drug information with generic name.
- Adequate quality control & drug control.
- Withdrawal of hazardous & irrational drugs.
- Drug legislation reform.[5]

About rational use of medicine from a doctor (As dentists) we have a professional responsibility for emergency dental care. When patients come with trauma, acute spread of infection, or hemorrhage, it is our duty to render treatment so that he gets relief in a reasonable time. In many acute dental conditions, extirpation of the pulp or extraction of the tooth will be necessary. Prescribing antibiotics is an adjunct in many such situations. When it is clinically indicated, it is

definitely of therapeutic benefit to the patient. But systemic antibiotics should be used with caution because of the possibility of toxicity, side effects, the development of resistant strains of microbes, and allergic reactions. According to the American Dental Association, the following guidelines should be observed when prescribing antibacterial drugs:

- ❖ make an accurate diagnosis;
- ❖ use appropriate antibiotics and dosing schedules;
- ❖ consider using narrow-spectrum antibacterial drugs (Clindamycin, Metronidazole, penicillin V Potassium) in simple infections to minimize disturbance of the normal micro flora, and preserve the use of broad-spectrum drugs (ampicillin, amoxicillin, erythromycin, tetracycline, etc.,) for more complex infections
- ❖ avoid unnecessary use of antibacterial drugs in treating viral infections;
- ❖ if treating empirically, revise treatment regimen based on patient progress or test results;
- ❖ obtain thorough knowledge of the side effects and drug interactions of an antibacterial drug before prescribing it;
- ❖ Educate the patient regarding proper use of the drug and stress the importance of completing the full course of therapy

American Academy of Pediatric Dentistry (AAPD) has given recommendations for clinical guideline on appropriate use of antibiotic therapy. Conservative use of antibiotics is indicated to minimize the risk of developing resistance to current antibiotic regimens. Whenever an antibiotic is prescribed to a female patient taking oral contraceptives to prevent pregnancy, the patient must be advised to use additional techniques of birth control during antibiotic therapy and for at least 1 week beyond the last dose as the antibiotic may render the oral contraceptive ineffective. American Academy of Pediatric Dentistry recommends the following general principles when prescribing antibiotics for the pediatric population. When a child presents with a facial swelling

secondary to a dental infection, he should receive immediate dental attention. Depending on clinical findings, treatment may consist of treating or extracting the tooth/teeth in question with antibiotic coverage. Severity of the infection, the ability to obtain adequate anesthesia, and the medical status of the child should be taken into consideration. Bacteria can gain access to the pulpal tissue through caries, exposed pulp or dentinal tubules, cracks into the dentin, and defective restorations. While rendering treatments like pulpotomy, pulpectomy, or extraction, antibiotic therapy usually is not indicated if the dental infection is contained within the pulpal tissue or the immediately surrounding tissue. In such a case, there will be no systemic signs of an infection (i.e., no fever and no facial swelling). Viral conditions such as acute primary herpetic gingivostomatitis should not be treated with antibiotic therapy unless there is strong evidence to indicate that a secondary bacterial infection exists. Analgesics are another group of drugs commonly prescribed by dentists. Our pain management goals should be: Pain Management Goals

- To maintain maximal patient comfort
- To minimize unwanted drug side effects, and
- To rapidly return injured tissue to function

Pre-procedural analgesia can be employed for delaying the onset of postoperative pain and to reduce its magnitude. But it has disadvantages like GI upset in patient with empty stomach and GI upset in anxious patient. Ibuprofen 400mg ½ hour before appointment can be prescribed for this purpose. Among the analgesics used in dentistry, nonopioid analgesics are the most commonly prescribed. Low doses of aspirin are known to cause some adverse effects such as gastrointestinal disturbances and risk of bleeding. The most commonly reported side effect is nausea. Aspirin significantly increases the bleeding time by inhibiting the aggregation of platelets. Aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs) may cause acute episodes of urticaria or angioedema. As a result of wide use and ready availability, salicylate is frequently the cause of intoxication. Poisoning or serious intoxication often occurs in children and is sometimes fatal. Overdoses of paracetamol are an increasingly common cause of acute liver failure. The inclusion of paracetamol in numerous medications in addition to its frequent

use must be a matter of concern not only for acute but also for chronic paracetamol toxicity. Paracetamol, salicylamide, and fenylbutazone are the analgesic and anti-inflammatory drugs most commonly used during pregnancy, although there are studies reporting teratogenic effects of these drugs on renal development of human fetus. [4]

1.5 Rational Use of Medicines: Activities

Ensure therapeutically sound and cost-effective use of medicines by health professionals and consumers improving the use of medicines by health workers and the general public is crucial both to reducing morbidity and mortality from communicable and non-communicable diseases, and to containing drug expenditure. Ideally, therapeutically sound and cost-effective use of medicines by health professionals and consumers is achieved at all levels of the health system, and in both the public and the private sectors. A sound rational drug use programme in any country has three elements:

- Rational use of medicines strategy and monitoring -- advocating rational medicines use, identifying and promoting successful strategies, and securing responsible medicines promotion.
- Rational use of medicines by health professionals -- working with countries to develop and update their treatment guidelines, national essential medicines lists and formularies, and supporting training programmes on rational use of medicines.
- Rational use of medicines by consumers -- supporting the creation of effective systems of medicines information, and empowering consumers to take responsible decisions regarding their treatment.

The above elements were developed in close collaboration with the regional and country offices. They are formulated in such a way as to reflect the main responsibilities of a national essential medicines programme.

- Rational medicine use strategy and monitoring: Support countries in implementing and monitoring a national strategy to promote rational use of medicines by health professionals and consumers.

- Rational medicine use by health professionals: Develop national standard treatment guidelines, essential medicine lists, educational programmes and other effective mechanisms to promote rational medicine use by health professionals.
- Rational medicine use by consumers: Establishing effective medicines information systems to provide independent and unbiased medicine information – including on traditional medicine – to the general public and to improve medicine use by consumers.[6]

1.6.1 Policies and structures to ensure rational use of medicines

Core interventions to promote rational use of medicines:

- A mandated multi-disciplinary national body to coordinate medicine use policies:

Many societal and health system factors, as well as professionals contribute to how medicines are used. Therefore, a multi-disciplinary approach is needed to develop, implement and evaluate interventions to promote more rational use of medicines. A national regulatory authority (RA) is the agency that develops and implements most of the legislation and regulation on pharmaceuticals. However, ensuring rational use requires coordination with other stakeholders in more activities than those normally covered by RAs. Thus a national body is needed to coordinate policy and strategies at national level, in both the public and private sectors. The form this body takes may vary with the country, but in all cases it should involve government (ministry of health), the health professions, academia, the RA, pharmaceutical industry, consumer groups and non-governmental organizations involved in health care. The impact on medicine use is better if many interventions are implemented together in a coordinated way, single interventions often having little impact. [7][8]

- Clinical guidelines:

Clinical guidelines (standard treatment guidelines, prescribing policies) consist of systematically developed statements to helpprescribers make decisions about appropriate treatments for specific clinical conditions. Evidence-based clinical guidelines are critical to promoting rational use of medicines. Firstly, they provide a benchmark of satisfactory diagnosis and treatment against

which a comparison of actual treatments can be made. Secondly, they are a proven way to promote more rational use of medicines provided they are:

- developed in a participatory way involving end-users; Easy to read;
- introduced with an official launch, training and wide dissemination;
- Reinforced by prescription audit and feedback.[7][8]

❖ Essential Medicines List based on treatments of choice:

Essential medicines are those that satisfy the priority health care needs of the population. The use of an essential medicines list (EML) makes medicine management easier in all respects. Procurement, storage and distribution are easier to do with fewer items, and prescribing and dispensing are easier for professionals as they have to know about fewer items. A national EML should be based upon national clinical guidelines and should be the focus for government activities in the public sector, e.g. procurement, distribution, insurance reimbursement policies and training. Only health workers who are approved to use certain medicines should be supplied with them. Medicine selection should be done in a transparent way by a central committee with an agreed membership and using explicit, previously agreed criteria, based on efficacy, safety, quality, cost (which will vary locally) and cost-effectiveness.[7][8]

❖ Drugs and therapeutics committees in districts and hospitals:

A drugs and therapeutics committee (DTC) is a committee designated to ensure the safe and effective use of medicines in the facility or area under its jurisdiction. Such committees are well-established in industrial countries as a successful way of promoting more rational, cost-effective use of medicines in hospitals. Governments may encourage hospitals to have DTCs by making it an accreditation requirement to various professional societies. DTC members should represent the administration and all the major specialties in any given facility. The members should also be independent and declare any conflict of interest. A senior doctor would usually be the chairperson and the chief pharmacist, the secretary. Unfortunately many DTCs are procurement committees. Their activities should however be much broader and should include developing or adapting clinical guidelines, medicines selection, monitoring medicines use and taking corrective

action, staff education, controlling drug promotional activities by pharmaceutical industry within the premises of the health facility and monitoring adverse drug reactions.[7][8]

❖ Problem-based training in pharmacotherapy in undergraduate curricula:

The quality of basic training in pharmacotherapy for undergraduate medical and paramedical students can significantly influence future prescribing. Rational pharmacotherapy training, linked to clinical guidelines and essential medicines lists, can help to establish good prescribing habits. Training is more successful if it is problem-based, concentrates on common clinical conditions, takes into account students' knowledge, attitudes and skills, and is targeted to the students' future prescribing requirements (WHO 1994).[7][8]

❖ Continuing in-service medical education as a licensure requirement:

Continuing in-service medical education (CME) is a requirement for licensure of health professionals in many industrialized countries. In many developing countries opportunities for CME are limited. In these countries no incentives are offered for CME since it is not required for continued licensure. CME is likely to be more effective if it is problem based, targeted, involves professional societies, universities and the ministry of health, and is face-to-face. Printed materials, such as bulletins or newsletters, that are unaccompanied by face to- face interventions, have been found to be ineffective in changing prescribing behavior. CME should be provided for all cadres of health worker including in the informal sector such as drug retailers. Often due to lack of public funds CME is heavily supported by the pharmaceutical sector and may thus be biased. Governments should therefore support efforts by university departments and national professional associations to give independent CME. [7][8]

❖ Supervision, audit and feedback:

Supervision is essential to ensure good quality of care. Supervision that is supportive, educational and face-to face will be more effective and better accepted by prescribers than simple inspection and punishment. Effective forms of supervision include prescription audit and feedback, peer review and group processes such as self-monitoring. Many industrialized

countries have a strong supervisory infrastructure but resources are often lacking for this in low-income countries. [7][8]

- Independent information on medicines:

Inadequate knowledge and lack of access to independent information about medicines significantly contribute to irrational use of medicines. Often, the only information that practitioners receive is provided by the pharmaceutical industry and may be biased. Provision of independent (unbiased) information is therefore essential. Drug information centers (DICs) and drug bulletins are two useful ways to disseminate such information. Both may be run by government or a university teaching hospital or a nongovernmental organization, under the supervision of a trained health professional. [7][8]

- Public education about medicines:

It is essential that the general public have the skills and knowledge to make informed decisions about when and how to use medicines, and to understand their potential risks as well as benefits. Without such knowledge and skills, people will often not get the expected clinical outcomes and may suffer adverse effects. This is true for prescribed medicines, as well as medicines used without the advice of health professionals. Governments have a responsibility to ensure both the quality of medicines and the quality of the information about medicines available to consumers. This will require:

- Ensuring that over-the-counter medicines are sold with adequate labeling and instructions that are accurate, legible, and easily understood by laypersons;
- Monitoring and regulating advertising, which may adversely influence both prescribers and consumers;
- Running targeted public education campaigns, which take into account cultural beliefs and the influence of social factors;[7][8]
- Avoidance of perverse financial incentives:

Financial incentives that encourage irrational use of medicines should be avoided. For example, prescribers who earn money from the sale of medicines (e.g. dispensing doctors) prescribe more medicines, and more expensive medicines, than prescribers who do not. The health system should therefore be organized to deter prescribers who dispense or sell medicines. Patients prefer to get 2-3 medicines rather than one if the total cost to them is the same regardless of the number of medicines. Flat prescription fees covering all medicines in whatever quantities within one prescription lead to over-prescription. User charges should therefore be made per medicine, not per prescription. Insurance policies should provide reimbursement only for essential medicines, not non-essential ones. [7][8]

1.6.2 Strategies to promote the rational use of medicines:

Governments:

- Do a situational analysis
- Evaluate the impact of programmes in terms of medicine use, quality of service and costs
- Lobby with doctors and MPs
- Involve consumers and the media
- World Health Organization (WHO) country offices to make recommendations to Ministry of Health (MOH) to establish units, with sufficient resources, devoted promoting rational use of medicines[9][10]

NGOs and donors:

- Advocate for the benefits of rational use of medicines from public health and financial perspectives
- Include a rational use of medicines indicator in every proposal
- Involve NGOs in rational use of medicines activities
- MOH/WHO to coordinate NGOs and donors, in collaboration with civil society, with regard to activities concerning rational use of medicines

WHO:

- Appoint staff in every region with a specific mandate to work in collaboration with MOHs to promote rational use of medicines
- Support countries to establish a unit on rational use of medicines within the MOH
- Undertaking advocacy
- Budget for activities on rational use of medicines[9][10]

1.6.3 Promoting rational use of medicines

Rational use of medication saves lives, makes sense and saves cents. It limits undesired toxicity and adverse events and maximizes on the benefits that can be derived from optimal use of medications. Patients are encouraged to always obtain advice from a healthcare provider to interpret symptoms of an illness and the appropriate remedy. One should avoid self-interpretation of symptoms, self-prescription of medication, and self-acquired remedies. It is equally important for one to view with caution advertisements that promote medications. Furthermore, it is just as bad for two people to share medications simply because they have the same symptoms or their situations are similar. Based on the review of innovative best practice and affordable health care models to improve clinical care and outcomes for chronic conditions, the WHO proposes the following nine strategies:

- Developing health policies and legislation to support comprehensive care;
- Reorganizing healthcare finance to facilitate and support evidence-based care;
- Coordinating care across conditions, healthcare providers, and settings;
- Enhancing flow of knowledge and information between patients and providers and across providers;
- Developing evidence based treatment plans and support their provision in various settings;
- Educating and supporting patients to manage their own conditions as much as possible;
- Helping patients to adhere to treatment through effective and widely available interventions;

- Linking health care to other resources in the community;

- Monitoring and evaluating the quality of services and outcomes.

1.6.4 The physicians' role

To ensure RUM, the role of physicians or health care providers should be enhanced through training and multidisciplinary practice in healthcare provision. In this regard, the WHO recommends certain pre-requisites to national governments for implementation; these include the establishment of national regulatory bodies and national drug policies. There are many areas of drug use that require tighter controls, such as the regulation and supervision of drug donations3,4, free health camps; and use of medicines.5 While philanthropy is the driving principle for most drug donations, it is not always guided by needs arising from the beneficiaries. Consequently, the donated drugs are not always the ones required and there is therefore the danger that they will be used inappropriately. Some donations are motivated by sinister motives such as dumping of surplus or expired drugs, promotion of certain brands, preliminaries to win future tenders, or political expediency. On the same note, free health camps bring health care to the people in dire need, albeit sporadically. In these situations irrational use may be promoted, for example, antibiotics may be prescribed for a short time and not be guided by both laboratory tests and good clinical diagnosis.[11][12][13]

1.7.1 WHO advocates 12 key interventions to promote more rational use

- Establishment of a multidisciplinary national body to coordinate policies on medicine use
- Use of clinical guidelines
- Development and use of national essential medicines list
- Establishment of drug and therapeutics committees in districts and hospitals
- Inclusion of problem-based pharmacotherapy training in undergraduate curricula
- Continuing in-service medical education as a licensure requirement
- Supervision, audit and feedback
- Use of independent information on medicines

- ❖ Public education about medicines
- ❖ Avoidance of perverse financial incentives
- ❖ Use of appropriate and enforced regulation
- ❖ Sufficient government expenditure to ensure availability of medicines and staff.[14]

1.7.2 WHO Drug Use Indicators

Purpose of Drug use indicators are-

- ❖ Objective measures (Indicators) that can describe the drug use situation in a country/region/Health facility.
- ❖ These indicators will allow Health planners, Managers and Researchers, to make basic comparisons between situations in different areas or at different times.
- ❖ The indicators can be used to measure the impact of the interventions undertaken.
- ❖ The indicators can serve as simple supervisory tools to detect problems in performance of individual providers or Health facilities.
- ❖ The drug use indicators can be used as "first line measures" to stimulate further questioning and to guide subsequent action.[WHO.1997][15]

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

- ❖ Prescribing practices by Health providers
- ❖ Patient care including both clinical consultation and pharmaceutical dispensing.
- ❖ Facility specific factors which support RUD.

1.7.3 Prescribing Indicators

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

Percentage of drugs prescribed by generic name = (number of drugs prescribed by generic name / total number of drugs prescribed) * 100;

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

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

Percentage of drugs prescribed from essential drugs list = (number of drugs prescribed from essential drugs list / total number of prescribed drugs) * 100.[16]

1.7.4 Patient Care Indicators

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

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

Percentage of drugs actually dispensed = (number of drugs actually dispensed / total number of drugs prescribed) * 100;

Percentage of drugs adequately labeled = (number of drugs adequately labeled / total number of drugs dispensed) * 100;

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[16]

1.7.5 Health Facility Indicators

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

Availability of copy of essential drugs list or formulary at health facility: yes or no.

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.

1.7.6 Complementary Drug Use Indicators

Percentage of patients treated without drugs

Average drug cost per encounter

Percentage of drug costs spent on antibiotics

Percentage of drug costs spent on injections

Prescription in accordance with treatment guidelines

Percentage of patients satisfied with care they received

Percentage of health facilities with access to impartial drug information [16]

Objectives:

The prescription order by a prescriber or a health care professional is important for rational use of drug for a patient the main objectives of my research work were to see:

- Health care facilities for the patients in my surveyed areas
- Public awareness about their health and medicine
- Proper use of medication
- Prescription pattern of prescribers in my surveyed areas
- Present condition of health facilities in surveyed areas
- The use of antibiotics whether proper use or not
- Expenditure of the treatment
- Patients satisfaction level

CHAPTER: TWO

MATERIALS AND METHODS

2.1 Study Area

This study was conducted in Kalkini Upazila in Madaripur Districts under Dhaka division. One hospital was chosen to do this work. The name of hospital was Upazila Health complex Kalkini. It has 31 seats for patients. The population of Kalkini Upazila is approximately about 12, 4000. The number of doctors in this hospital is 8 and most of them are M.B.B.S. This hospital has a diagnostic center with 24hrs doctors and ambulance service. This hospital sometimes overloaded with in-patient and out-patient. It is the only one general hospital in Kalkini upazila. It has 24hrs doctor and ambulance facilities. It also sometimes overloaded due to shortage of seats for huge population.

2.2 Survey Method

The study was a cross-sectional survey of all prescriptions received from the patients over four 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 inject able medications were prescribed, if antibiotics, OTC drugs and vitamins are prescribed). Data was analyzed using Microsoft Excel Software and excel software 55 prescriptions of patients were collected, prospectively September 2010 to December 2010. The survey was conducted among the in-patients and out-patients.

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

- Number of drugs per prescription,
- Number of antibiotics per prescription,
- Number of drugs prescribed by generic name.
- Number of drugs prescribed from the WHO Model List of Essential Medicines (EML)
- 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.

2.3 Inclusion of study

- In- patients and out-patients
- Services holder
- Students
- House wife
- illiterate
- Town patients
- Rural patients

2.4 Exclusion of study

- Child and neonate
- City Patients

CHAPTER: THREE

RESULT

Results:

Figure: 3.1: Distribution of the ages among the people of the study area.

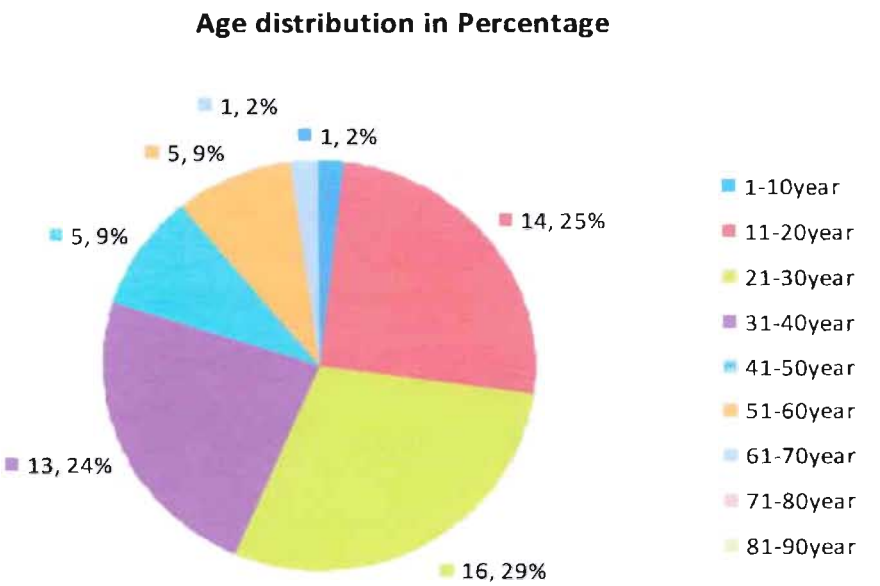

Figure 2.1: Distribution of Age (Pie Chart)

This figure shows that, from the total area of age 1-10 occupied only 1%, age 11-20 occupied 25%, age 21-30 occupied 29%, age 31-40 occupied 24%, age 41-50 occupied 9% and age 51-60 occupied 9%. In addition to that it can be concluded that the age between 61 to 70 occupied only 2%, age range 71-80 occupied 2% and age range 81-90 having no occupied area.

Table 3.1: Distribution of the gender among the people of .....

Sex	Number	Population (%)
Male	30	55%
Female	25	45%

Table 2.1: Distribution of Gender

Figure 3.2: Distribution of the gender among the people of .....

Figure 3.2: Distribution of Gender (Pie Chart)]

The figure shows that the male carries 55% on the contrary of female carries only 45 % in the study area.

Figure 3.3: Distribution of height among the people of study area.

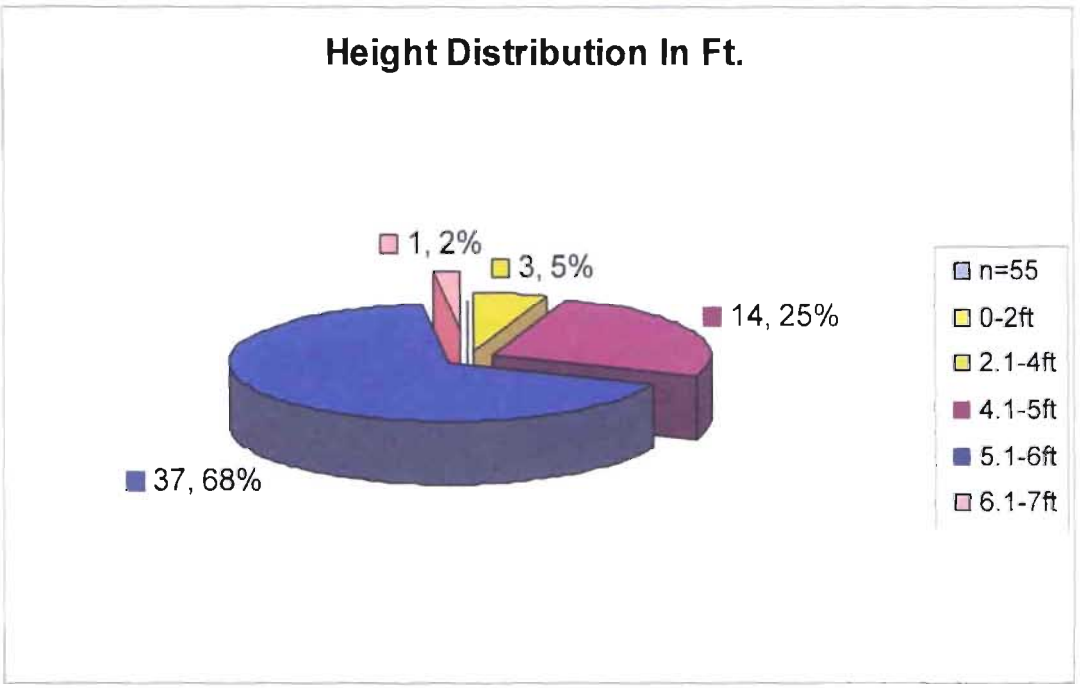

Figure 3.3: Distribution of Height (Pie Chart)

This figure described that the total no. of patients are 55. Among them the patients whose height range was 0-2 ft, they occupied 0%. On the other hand the patients whose height range were 2.1- 4 ft, they contained 5%, 4.1-5 ft occupied 25%, 5.1-6 ft occupied 68% and 6.1-7 ft occupied only 2%.

Figure 3.4: Distribution of weight among the people of the study area.

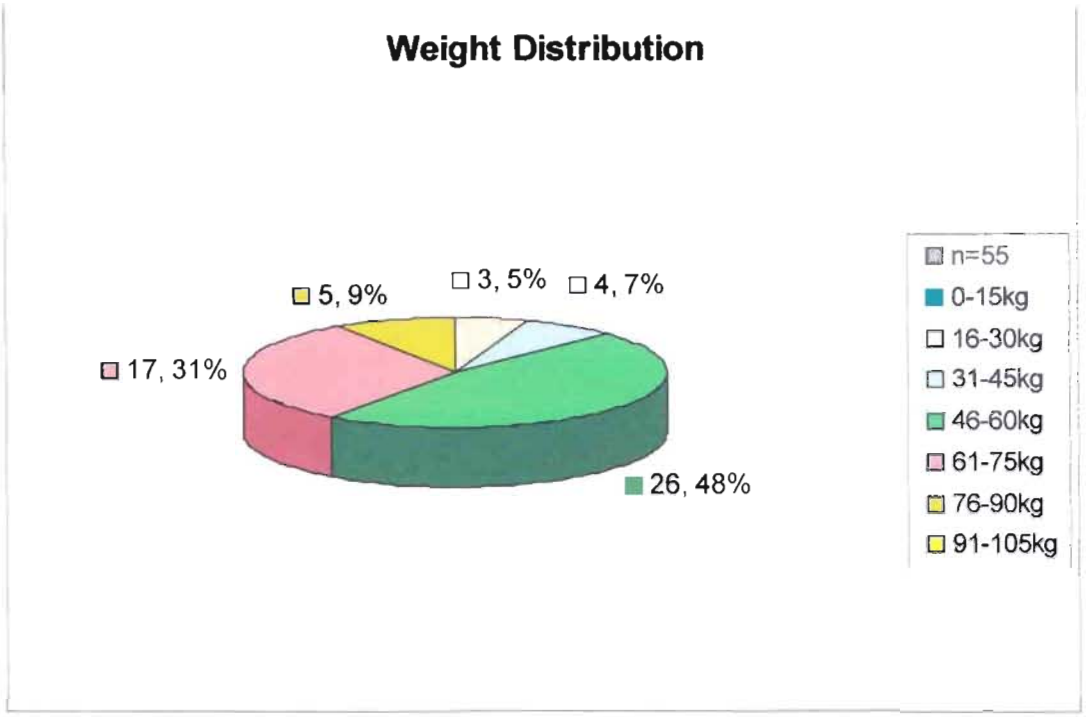

Figure 3.4: Distribution of Weight (Pie Chart)

From the figure, it can be concluded that the weight range 0-15 kg occupied 0%. On the other hand the weight range 16-30 kg, 31-45 kg, 46-60 kg, 61-75 kg, 76-90 kg and 91-105 kg occupied 5%, 7%, 48%, 31%, 9% and 0% respectively.

Figure 3.5: Distribution of Living Area of the included patients in the study.

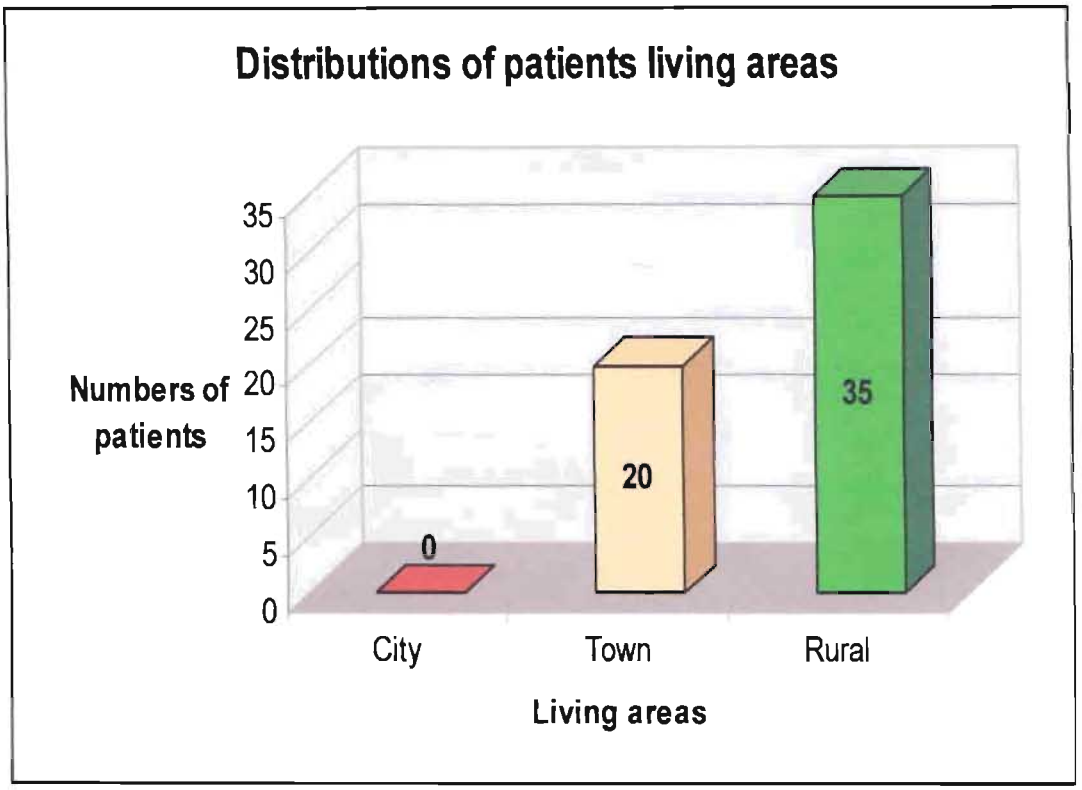

Figure 3.5: Distribution of Living Area (Bar diagram)

Among the total no. of patients (55), 35 patients lived in rural area, 20 patients lived in town on the contrary there was no patient who lived in city in this figure.

Figure 3.6: Distribution of the Educational Level of included patients in the study area.

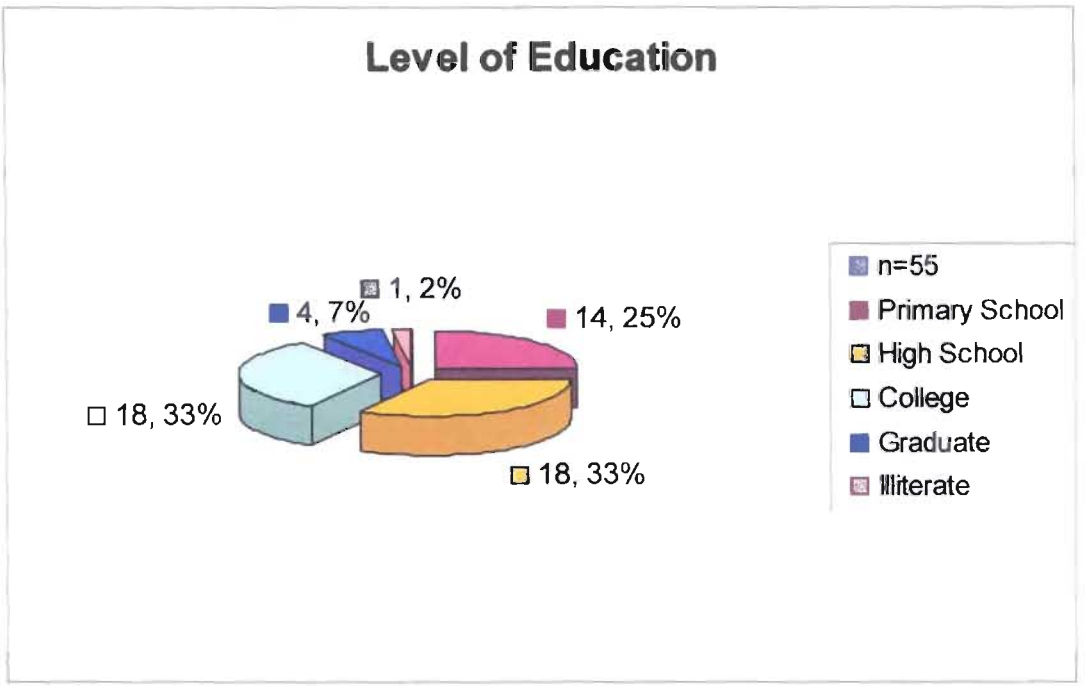

Figure 3.6: Distribution of Education Level.

In this study, the total no. of patients was 55. Among these patients 25% patients were in primary level and 33% patients were in high school level. On the other hand 33%, 7% and 2% patients were college level, graduate level and illiterate respectively.

Table3.2: Distribution of Occupation of the patients in the study area.

Occupation	Number	Population (%)
Student	11	**20%**
Business	7	**13%**
Service Holder	3	**5%**
Housewife	21	**38%**
Others	7	**13%**
Do Nothing	2	**4%**

This table shows that the various types of occupational category are present among the patients. 20% patients were students and 13% patients were doing there own business. In addition to that 5%, 38%, 13% and 4% patients were service holders, housewives and do nothing respectively.

Figure: 3.7: Distribution of the Income range of the patients.

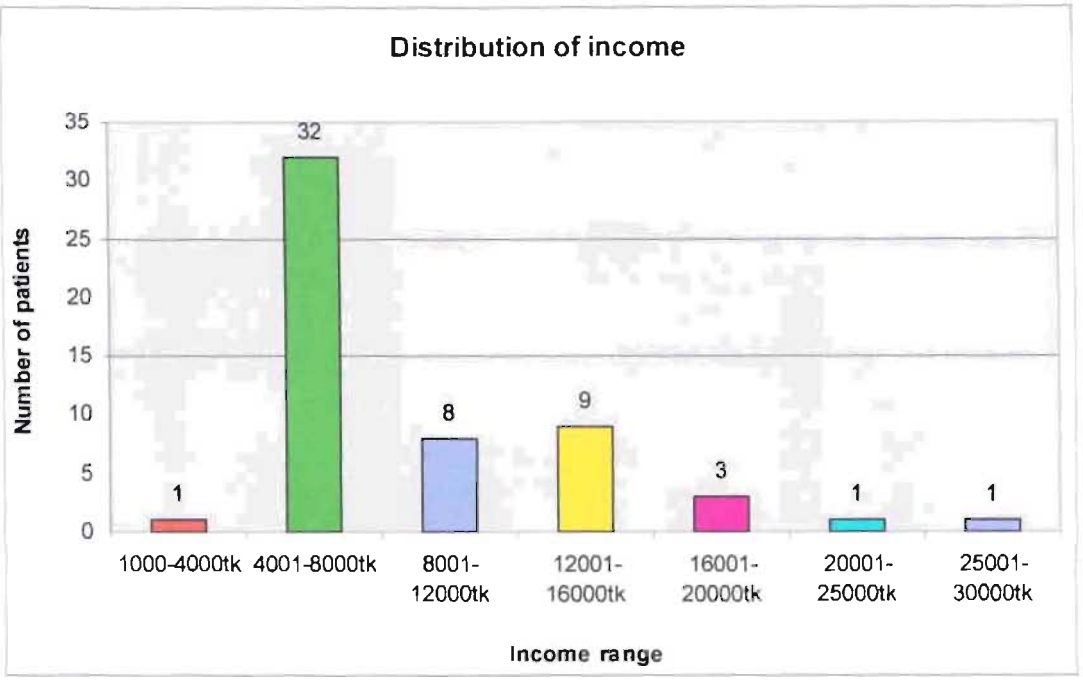

Figure: 3.7: Distribution of Income (Line Diagram)

From the line diagram it can be concluded that the x axis represents the income range and y axis represents the numbers of patients. Here there was only one patient whose income range was 1000 - 4000 tk, there were 32 patients whose income range was 4001 - 8000 tk. On the other hand there were 8, 9, 3, 1 and 1 patient, whose income range were 8001-12000 tk, 12001-16000 tk, 16001-20000 tk, 20001-25000 tk and 25001-30000 tk respectively.

Figure 3.8.: Distribution of Drugs in Average among the people in the study area.

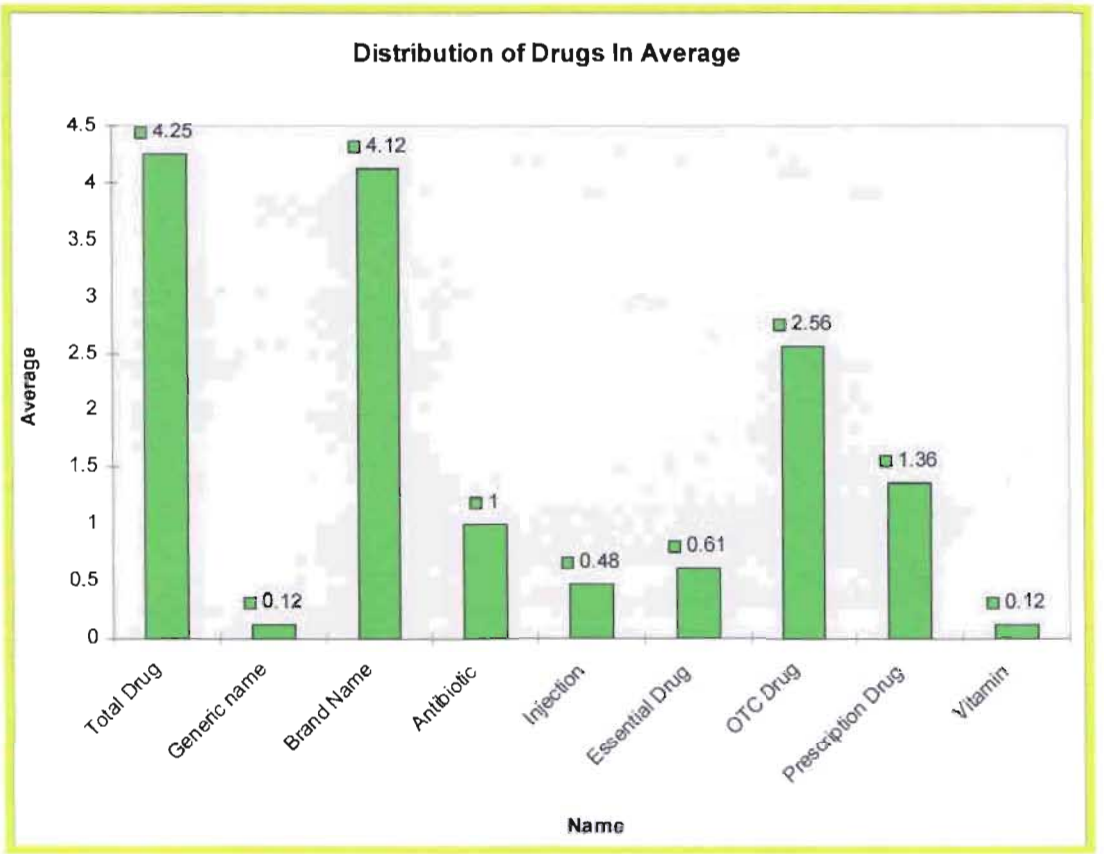

Figure 3.8.: Distribution of Drugs in Average (Bar Diagram)

This above bar diagram illustrates the distribution of average drugs. Here the average of the total drugs was 4.25 and average of the drugs that were prescribed as generic name was 0.12 and the average of the drugs that were prescribed as brand name was 4.12. On the other hand, the average of the antibiotic, injection, essential drugs, OTC drugs, prescription drugs, and vitamins were 1%, 0.48%, 0.61%, 2.56%, 1.36% and 0.12% respectively.

Figure: 3.9: Average number of drugs per encounter of the patients.

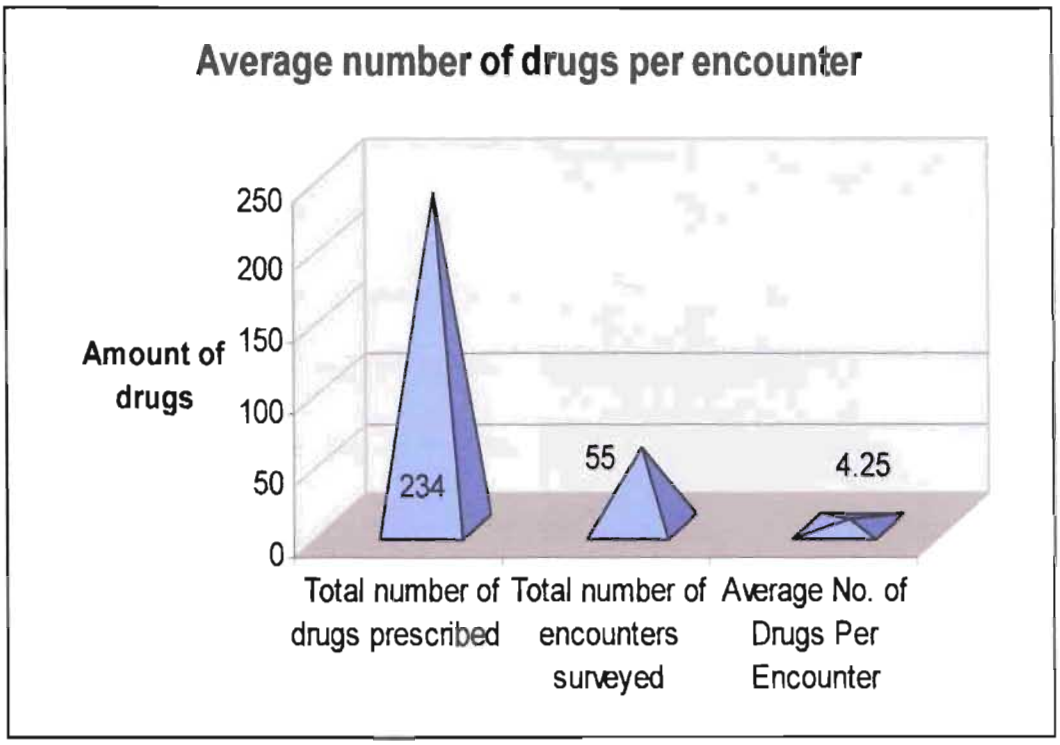

Figure 3.9: Average number of drugs per encounter

This figure shows that the total no. of drugs prescribed, total no. of encounters surveyed and average no. of drugs per encounter. Here the total no. of patients was 55. Among the 55 patient the total no. of drugs prescribed were 234 and the total no. of encounters surveyed were 55 and the average no. of drugs per encounter were 4.25.

Figure 3.10: Distribution of prescribing pattern in Percentage of the patients.

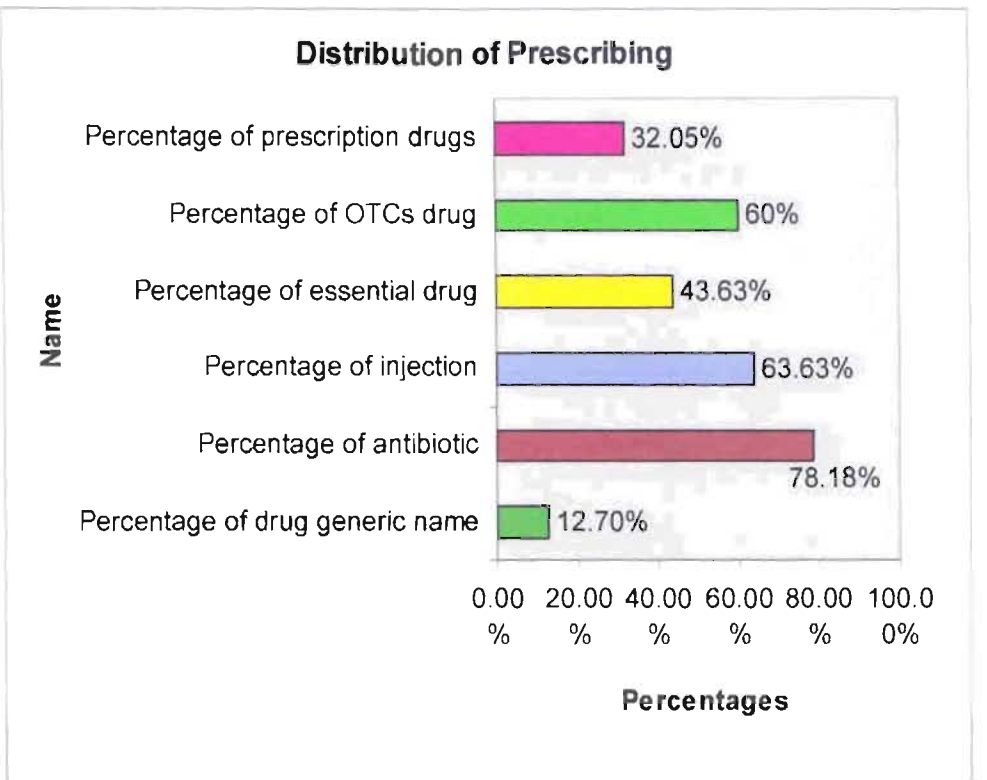

Figure 3.10: Distribution of prescribing pattern in Percentage.

This bar diagram shows that the distribution of prescribing pattern in percentage. Here the percentage of prescription drugs were 32.05% and the percentage of OTCs drugs were 60%, while the percentages of essential drugs, percentage of injections, percentage of antibiotics and the percentage of generic name of the drugs were 43.63% ,63.63%, 78.18% and 12.70% respectively.

Figure: 3.11: Distribution of Time of the patient care in the study area.

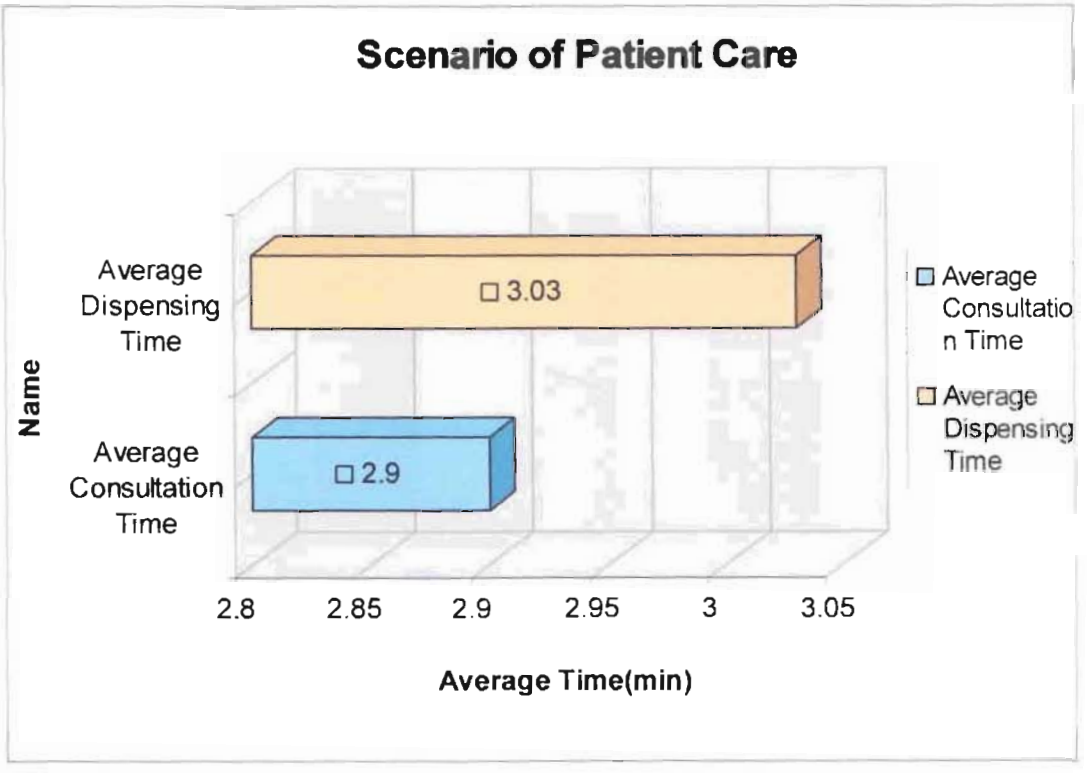

Figure: 3.11: Distribution of Time.

The scenario of the patient care described the average dispensing time and average consultation time. Here the average dispensing time was 3.03 min., on the other hand the average consultation time was 2.9 min.

Figure 3.12: Distribution of Drugs for patient care in the study area.

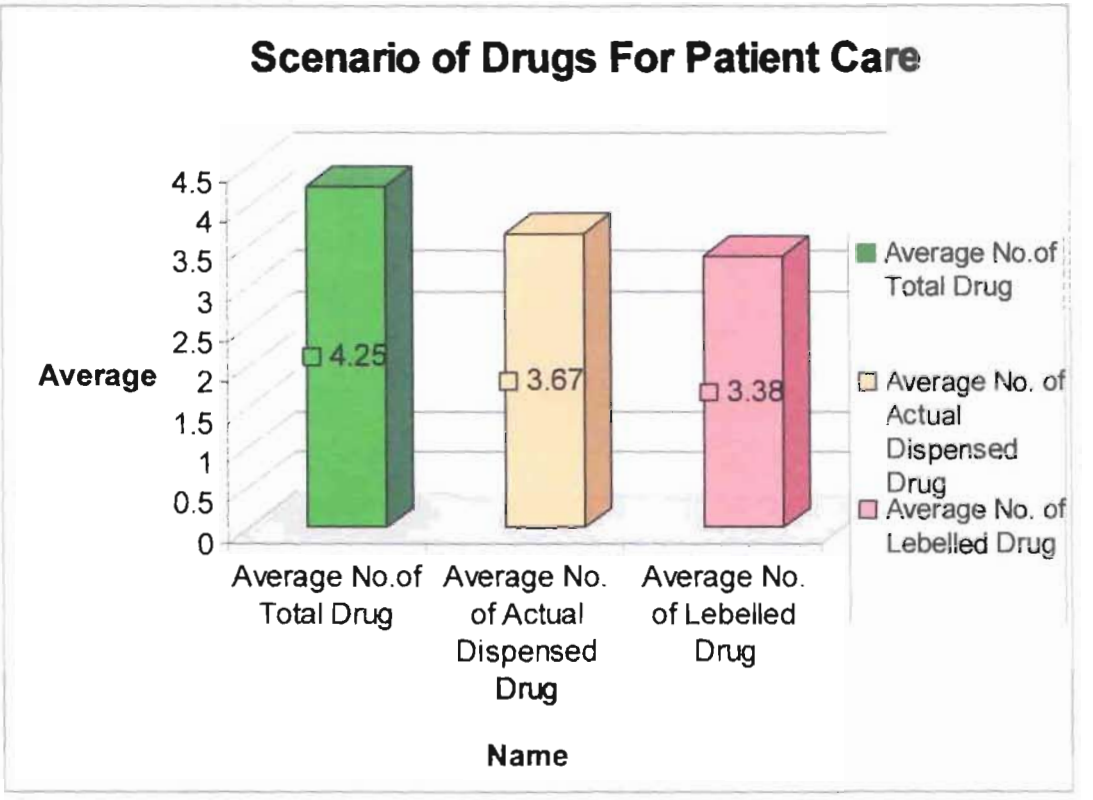

Figure 3.12: Distribution of Drug for patient care (Line Chart)

Here the figure shows the scenario of the given drugs for the patient care. The no. of total drugs were average 4.25, average no. of actual dispensed drug 3.67 and average no. of labeled drugs were 3.38.

Figure 3.13: Distribution of Dosage schedule of the patients in the study area.

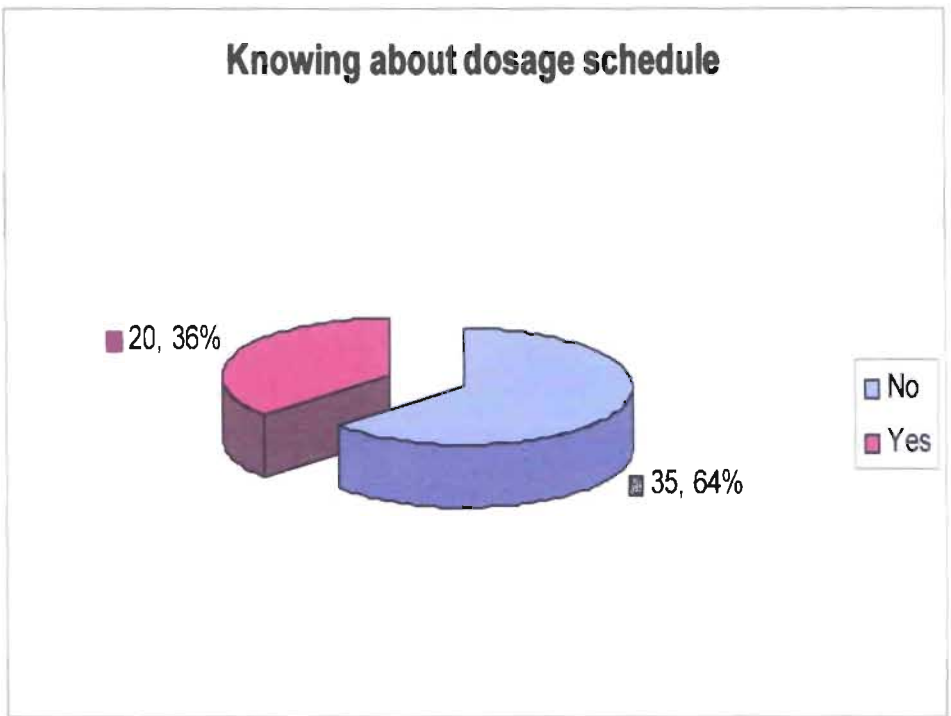

Figure: 3.13: Distribution of Dosage schedule (Pie Chart)

This pie chart shows the information about the patient who knows the dosage schedule. Here among the 55 patients 36% were aware about the dosage schedule, on the contrary only 64% were not informed about the dosage schedule.

Figure 3.14: Distribution of Drug Cost per day among the patients in the study area.

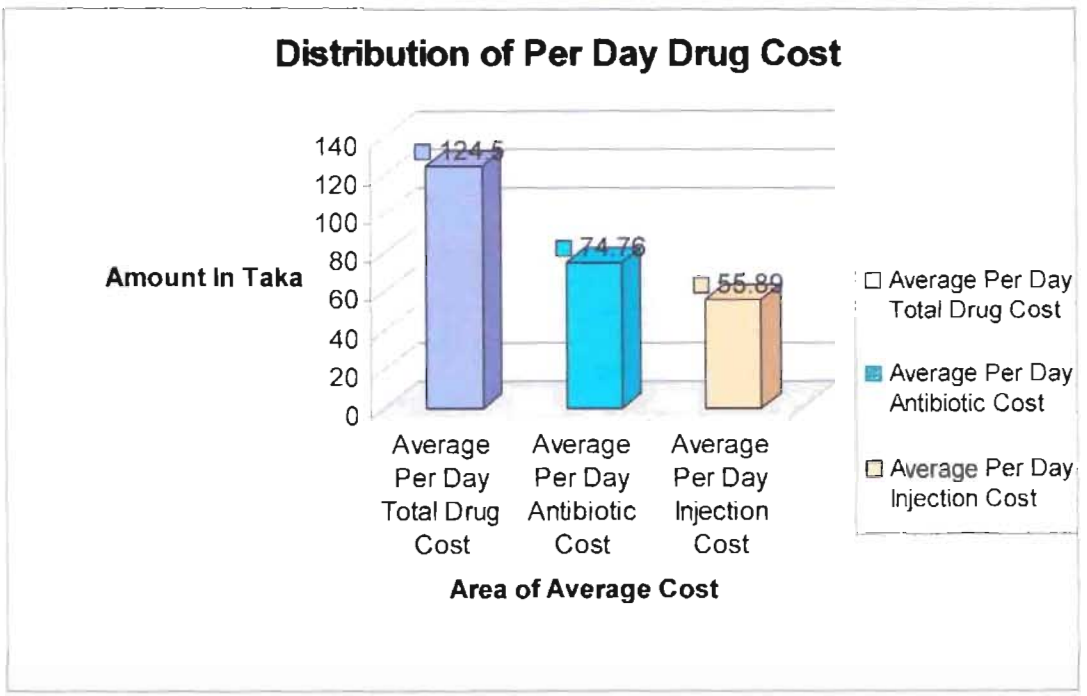

Figure: 3.14: Distribution of Drug Cost

This diagram illustrated the distribution of per day drug cost among 55 patients. Here the average per day total drug cost was 124.5 tk, average per day antibiotic cost was 74.76 tk and average per day injection cost was 55.09 tk.

Figure 3.15: Percentage distribution of patient's satisfaction in the study area.

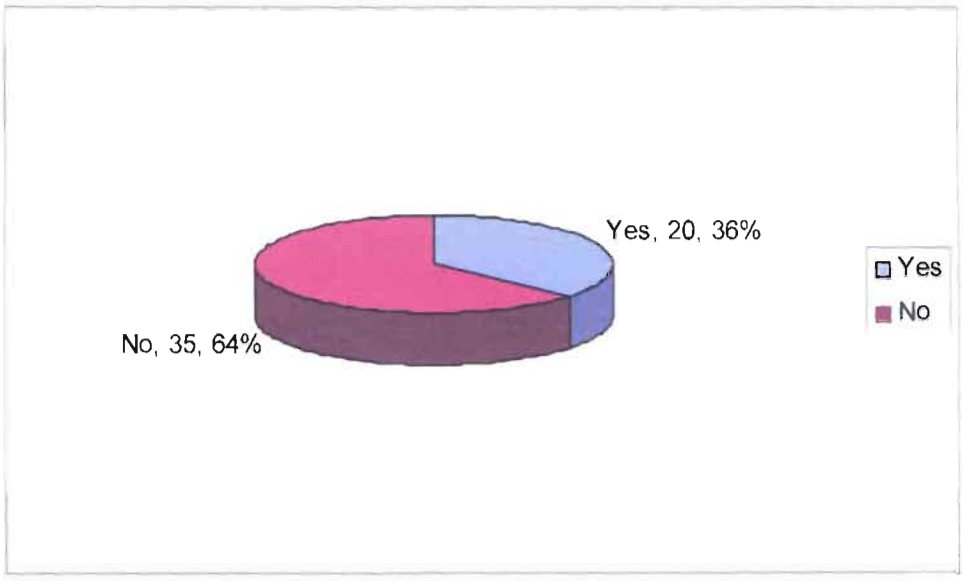

Figure 3.15: Percentage of Patients Satisfaction

From the above pie chart it can be concluded that, only 36% patient were satisfied with treatment, on the other hand 64% patients were not satisfied with the treatment which they have given.

CHAPTER: FOUR

DISCUSSION

4. Discussion:

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. The main objective of this study is to promote the "Rational use of medication" 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 prescribes and patients, understand the adverse impacts of inappropriate use of drugs; describe factors which influence the decision-making process and specific medication use problems. During this study period, 55 prescriptions were surveyed. Among 55 volunteers, 2% patients were found between the age of 1-10years, 29% patients were found between the age of 21-30years & 24% patients were in 31-40 years range. Among these 55 volunteers 55% were male & 45% were female. The average height of the volunteers was 5.25ft. 68% percent volunteers were found between the heights of (5.1-6) Feet. The average weight of the volunteers was 59.12 kg. Forty eighty percent volunteers were found between the weights of 46-60kg. Thirty six percent volunteers were from urban areas and where 64% volunteers were from rural areas. Educational status of volunteers were like in primary level 25%, in high school level 33%, in college level 33%, in graduate level 7% and 2% volunteers were illiterate. Among 55 volunteers students were 20%, businessman were 13%, housewives were 38%, service holders were 5% & 13% were found others and 2% were found do not nothing. Among these volunteers 58% earned money between the range Tk (4001-8000), 15% earned Tk (8001-12000) & 2% earned Tk (1000-4000) 16% were found earned Tk (12001-16000).

This was a prescription based survey. It was found that among 55 prescriptions, total number of drugs prescribed was 234 and average was 4.25±1.54. It was found from other studies that in Indonesia averagely 3.5 drugs were prescribed per prescription. [17] In Malaysia average 2.79 drugs were prescribed per prescription. [20] We know that, if 5 or more drugs are prescribed in per prescription known as polypharmacy. So compared with references country average drugs were more in my survey area

In this study, the average number of drugs prescribed by generic name was 0.127± 0.33 per prescription and the average number of drugs prescribed by brand name was 4.12± 1.65 per prescription. According to WHO drugs must be prescribed by generic name. But in this study only 12.70% drugs were prescribed in generic name & 87.3% drugs were prescribed by brand name. Where in Indonesia 60% drug was prescribed by generic name & in Western Nepal 15% drug was prescribed by generic name. In Laos 78% drug was prescribed by generic name. [18] [19]

In our study the average number of prescriptions drugs was 1.36±.75 prescribed per prescription where the average number of over the counter drugs was 2.56±1.11 prescribed per encounter. OTC denotes Over the Counter Drugs which needs no prescription to be prescribed.

In this study, the average number of Essential drugs prescribed was .61±.78 per prescription. A total of 34 drugs were prescribed from the essential drug list of Bangladesh. In Malaysia's five different states (KualaLampur, Johor, Perak, Phang & Sabah) prescribed 100% drugs from EDL.[20] In Western Nepal only 40% of drugs were from the Essential drug list of Nepal and 29.44% were from the WHO Essential drug list.[18] In Laos 84% drug was prescribed from EDL. [19] So in this survey we can see WHO guide lines were not followed.

From this study, the average number of antibiotics was 1±0.66 prescribed per prescription. The percentage of prescription with an antibiotic prescribed was almost 78.18%. From the international perspective a study in Malaysia shows the percentage of antibiotic prescribed was 23.15%, in Western Nepal 48% antibiotic was prescribed, in Indonesia 40% antibiotic was received by patients and in Laos 47% antibiotic was prescribed. [17][18][19][20] For primary health care or clinically needed the range of prescribing antibiotics was 30–60% in developed and developing countries. [21] Because the uses of antibiotic drugs are more sensitive than any other drugs that prescribed in a prescription. Above the circumstances we can say that in Kalkini upazila the uses of

antibiotic drugs were improper. According to WHO, antibiotics misuse has been contributed to the worldwide increase in antimicrobial resistance that is now being observed for major infectious diseases including tuberculosis, gonorrhea, malaria, bacterial diarrhea and pneumonia.[22]

From this survey, it was reflected that over-prescribing of injections was done. The percentage of injection use was 63.63%. The average number of injections was 0.48±.48 prescribed per prescription in our study. A survey about injections used in Laos was 18%, in Malaysia 1.66%, in Ghana was 80%.[27][29] According to WHO, a lot of patients and even health workers in many countries think that injections are more effective than tablets. This may lead to unnecessary expenditure and health risks. [23]

The average number of Vitamins was 0.127 ±0.38 prescribed per encounter. Vitamins need not be included in a prescription to be prescribed.

In terms of patient care in this survey showed that, the average consultation time was 2.9 (min) & the average dispensing time was 3.3(min). In international perspective in Nepal the average consultation & dispensing time was 3.7& 1.3 (min). In Indonesia the average consultation time was 3.5 (min). In this survey shows that the actually dispensed drug was 3.67 from drug store and adequately labeled drug was 3.38 The remaining drugs were either not available in the pharmacy or the patients had the drugs in their home or the patients did not have enough money to buy them. This survey also shows that only 36% patients have drug dosing knowledge and 64% patients don't know about dosage schedule. Where in Indonesia 83% & in Nepal 55% patients knows about dosage schedule. For lack of proper education, less awareness about medicine less cooperation of practitioners in this areas people would not able to know the drug dosage schedule properly. [17][18]

In terms of complementary drug use this survey showed that, the average per day drug cost was 124.5 (tk), average per day cost on antibiotic was 74.76 (tk) & average per day cost on injection was 55.89(tk). The percentage of drug cost spent on antibiotic &

injection was respectively 60.04% & 45.07%. Here this survey also shows that only 36% patients were satisfied by care what they were received. For lower monthly income, excessive price of drugs, in proper physician's care, inappropriate drug dosing knowledge etc. patients in this area were not satisfy by the care that they were receive.

Above this study, it is clear that the prescribers don't follow the WHO guidelines for drug prescribing which leads to increase the irrational use of drugs.

CHAPTER: FIVE

CONCLUSION

5. Conclusion:

Medicine should be taken only when needed under the supervision of a doctor or prescriber. Ensuring that the correct drug is given to the appropriate patient should be a high priority for all health professionals. This study highlights the continuing crisis of irrational drug prescribing pattern in my survey area also other places in Bangladesh. This survey result was compared with other previous survey results about "Rational use of drugs" of different countries and it is quit evident that the prescribing pattern is not rational like regarding some particular parameters like polypharmacy, Brand prescribing, more prescribing of non-essential drugs, overuse of antibiotics, more use of injection, average per drug cost and less counseling time and patients satisfaction.

CHAPTER: SIX

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ANNEXURE

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

East West University

Department of Pharmacy
43, Mohakhali C/A, Dhaka-1212

Rational Use of Drug-In Kalkini Upazila, Madaripur 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 income ☐

Prescribing Indicators

Name of drugs Prescribed

A ..... D.....
B..... E.....
C..... F.....

11. Number of Drugs prescribed ☐

12. Number of Drugs prescribed in Generic name ☐

13. Number of Antibiotics ☐

14. Is injection prescribed ☐ **Yes** ☐ **No**

15. Number of injection prescribed ☐

16. Number of Essential Drugs ☐

17. Number of OTC Drugs ☐

18. Number of Prescription Drugs ☐

19. Number of Vitamins ☐

20. Number of Drugs prescribed in Brand name ☐

Patient Care Indicators

21. Consultation time ☐ **1-5 min** ☐ **6-10 min** ☐ **11-15 min**

☐ **16-20 min** ☐ **More than 20 min**

22. Dispensing time ☐

23. Numbers of drugs are actually dispensed ☐

24. Numbers of drugs are adequately labeled ☐

25. Patients knows about the dosage schedule ☐ Yes ☐ No

Health Facility Indicators

26. Name: ☐

27. Location: ☐ **City** ☐ **Town** ☐ **Rural**

28. Seats: ☐

29. Type:

☐ **General hospital**

☐ **Specialized hospital**

☐ **Community hospital**

30. Are the key drugs available in hospital ☐ **Yes** ☐ **No**

31. Is the copy of essential drugs list available in hospital ☐ **Yes** ☐ **No**

32. Drug cost per day [ ]

33. Drug costs spent on antibiotic [ ]

34. Drug costs spent on injection [ ]

35. Are patients satisfied with care they received [ ]

_____ _____

Signature of Responder **Signature of Interviewer**