SCENARIO OF AWARENESS ABOUT RATIONAL USE OF MEDICINE

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Certificate

This is to certify that the results of the investigation that are embodied in this project are original and have not been submitted before in substance for any degree or diploma of this university. The entire present work submitted as a project work for the partial fulfillment of the degree of bachelor of pharmacy, is based on the result of author's (Moutushi Roy, ID: 111-29-303) own investigation.

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Chapter One

Introduction

1.1 Rational use of medicine:

In 1985, the World Health Organization defined the rational use of medicines 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"[3]

These requirements will be fulfilled if the process of prescribing is appropriately followed. This includes:

- ✓ Steps in defining patient's problems (or diagnosis).
- ✓ In defining effective and safe treatments (drugs and non drugs)
- ✓ In selecting appropriate drugs, dosage and duration.
- ✓ In writing a prescription.
- ✓ In giving patients adequate information.
- ✓ In planning to evaluate treatment responses.

The rational prescribing should meet the following criteria:

- ***Appropriate indications*:** 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 contraindications exist and the likelihood of adverse reaction 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 conditions and the medication(s) that are prescribed.
- ***Appropriate Monitoring*:** The anticipated and unexpected effects of medications should be appropriately monitored.

Unfortunately, in real practice, prescribing patterns do not always conform to these criteria and can be classified as "inappropriate" or "irrational" prescribing. Irrational Prescribing can be regarded as "pathological" prescribing, where the above mentioned criteria are not fulfilled. [1]

1.2 Irrational use of medicine:

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, underuse 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]

1.3 Irrational Prescribing

Common patterns of irrational prescribing may be manifested in the following forms:

- o The use of drugs, when no drug therapy is indicated. Eg. Antibiotics for viral URI infections.
- o The use of a wrong drug for a specific condition requiring drug therapy. Eg. Tetracycline in child hood diarrhea requiring ORS.
- o The use of drugs with doubtful / unproven efficacy. Eg. The use of antimotility agents in acute diarrhea.
- o The use of drugs of uncertain safety status. Eg. The use of Baralgan etc.
- o Failure to provide available, safe and effective drugs. Eg. Failure the vaccinate against measles, tetanus, etc.
- o Failure to prescribe ORS for acute diarrhea.
- o The use of correct drug with incorrect administration, dosage and duration. Eg. The use of IV metronidazole, when oral or suppository formulations would be appropriate.
- o The use of unnecessary expensive drugs. Eg. The use of third generation, broad - spectrum antimicrobial, when a first line, narrow spectrum agent is indicated.

Some examples of commonly encountered, inappropriate prescribing practices in many health care settings include:

- Over use of antibiotics and antidiarrheal for non specific childhood diarrhea.
- Indiscriminate use of injections.
- Multiple drug prescriptions.
- Excessive use of antibiotics for treating minor ARI.
- Minerals and tonics for malnutrition.

1.4 Factors underlying the irrational use of Drugs

There are many different factors which affect the irrational use of drugs, which can be categorized as those deriving from the following factors:

** Patients - Drug misinformation*

- Misleading beliefs
- Patient demands / expectations.

** Prescribers - Lack of education and training*

- Inappropriate role models
- Lack of objective drug information
- Misleading beliefs about drugs efficiency

** Work place - heavy patient load.*

- Pressure to prescribe.
- Lack of adequate lab capacity
- Insufficient staffing.

** Drug supply*

- Unreliable suppliers system
- Drug shortages
- Expired drugs supplied

** Drug Regulation- Non-essential drugs available.*

- Non-formal prescribers.
- Lack of regulation enforcement.

All these factors are affected by various attitudes that are prevailing among the prescribers and consumers. In some areas the use of injections remains high due to the false assumption of the prescribers that injections will improve patients satisfaction and that they are always expected by the patients. In some countries, the frequent use of injections is declining because of the fear of AIDS.

1.5 Impact of Irrational use of Drugs

This can be seen in many ways:

- ✓ Reduction in the quality of drug therapy leading to increased morbidity and mortality.
- ✓ Waste of resources leading to reduced availability of other vital drugs and increased costs.
- ✓ Increased risk of unwanted effects such as adverse drug reactions and the emergence of drug resistance.
- ✓ 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.[1]

1.6 Medicines that should be taken carefully:

1.6.1 Antibiotics

Antibiotics are medications used to treat, and in some cases prevent, bacterial infections. They can be used to treat relatively mild conditions such as acne as well as potentially life-threatening conditions such as pneumonia.

However, antibiotics often have no benefit for many other types of infection and using them unnecessarily would only increase the risk of antibiotic resistance, so they are not routinely used. [4]

1.6.1.1 Resistance to Antimicrobial Agents

Resistance to antimicrobial agents is one of the greatest problems faced by the medical community. These powerful weapons, developed by spending millions of dollars and years of dedicated research, have been rendered less effective or totally ineffective only because of our own negligence and complacence. This is indeed frustrating.

Antibiotic resistance has been called one of the world's most pressing public health problems. Almost every type of bacteria has become stronger and less responsive to antibiotic treatment

when it is really needed. These antibiotic-resistant bacteria can quickly spread to family members, schoolmates, and co-workers - threatening the community with a new strain of infectious disease that is more difficult to cure and more expensive to treat. For this reason, antibiotic resistance is among CDC's top concerns.

Antibiotic resistance can cause significant danger and suffering for children and adults who have common infections, once easily treatable with antibiotics. Microbes can develop resistance to specific medicines. A common misconception is that a person's body becomes resistant to specific drugs. However, it is microbes, not people that become resistant to the drugs.

If a microbe is resistant to many drugs, treating the infections it causes can become difficult or even impossible. Someone with an infection that is resistant to a certain medicine can pass that resistant infection to another person. In this way, a hard-to-treat illness can be spread from person to person. In some cases, the illness can lead to disability or even death. [7]

Every time a person takes antibiotics, sensitive bacteria are killed, but resistant germs may be left to grow and multiply. Repeated and improper uses of antibiotics are primary causes of the increase in drug-resistant bacteria. While antibiotics should be used to treat bacterial infections; they are not effective against viral infections like the common cold, most sore throats, and the flu. Widespread use of antibiotics promotes the spread of antibiotic resistance. Smart use of antibiotics is the key to controlling the spread of resistance. [6]

Antibiotic resistance is the ability of bacteria or other microbes to resist the effects of an antibiotic. Antibiotic resistance occurs when bacteria change in some way that reduces or eliminates the effectiveness of drugs, chemicals, or other agents designed to cure or prevent infections. The bacteria survive and continue to multiply causing more harm. [7]

Antibiotic resistance occurs when bacteria change in some way that reduces or eliminates the effectiveness of drugs, chemicals, or other agents designed to cure or prevent infections. The bacteria survive and continue to multiply causing more harm. Bacteria can do this through several mechanisms. Some bacteria develop the ability to neutralize the antibiotic before it can do harm, others can rapidly pump the antibiotic out, and still others can change the antibiotic attack site so it cannot affect the function of the bacteria.

Antibiotics kill or inhibit the growth of susceptible bacteria. Sometimes one of the bacteria survives because it has the ability to neutralize or escape the effect of the antibiotic; that one bacterium can then multiply and replace all the bacteria that were killed off. Exposure to antibiotics therefore provides selective pressure, which makes the surviving bacteria more likely to be resistant. In addition, bacteria that were at one time susceptible to an antibiotic can acquire resistance through mutation of their genetic material or by acquiring pieces of DNA that code for the resistance properties from other bacteria. The DNA that codes for resistance can be grouped in a single easily transferable package. This means that bacteria can become resistant to many antimicrobial agents because of the transfer of one piece of DNA. [6]

The following table provides on overview of some of the recent examples of resistance to antimicrobials:

Organism	Resistance
Gram Positive cocci	Methicillin resistant Staph. aureus and coagulase negative Staphylocci, penicillin resistant Pneumococci, macrolide resistant Streptococci.
Gram negative cocci	Penicillin, quinolone resistant gonococci.
Gram negative bacilli	Enterobacteriaccae resistant to B lactams and B lactamase inhibitors, multi drug resistant pathogens include Shigella, E. Coli, Salmonella.
Acid fast bacilli	Multi drug resistant M. tuberculosis.

1.6.1.2 Over-prescribing antibiotics:

70-80% of prescriptions for antimicrobials are probably written unnecessarily. "Antibiotics have been given for everything from headaches to ingrown toenails; they are swallowed, sucked, injected and smeared; they are painted on cuts, dumped into wounds, fed to the chickens and pigs and spread on the floors of the hospital wards."

1.6.1.3 Reasons of over-prescribing antibiotics

1.6.1.3.1 Lack of confidence: While it is very easy to scribble a prescription, it takes a fair amount of courage to avoid unnecessary prescriptions. Inability to make a fairly accurate clinical diagnosis is one of the most common causes for over-drugging. Inability to convince the patient about the nature and simplicity of the illness and about the non-requirement of antibacterials is another reason. Some doctors may harbour a notion that it is better to give "something powerful" for every patient so as to achieve "dramatic" results (Shot Gun therapy). But the fact remains that most patients do not demand any particular prescription from their doctor and many are indeed happy if they are explained about their problem and prescribed as less drugs as possible.

1.6.1.3.2 Peer pressure: Some doctors may have a fear that if they do not prescribe, their 'next door' colleague may prescribe these 'powerful' drugs and get all the credit for 'curing' the patient. To avoid this 'loss of practice' they tend to prescribe these 'powerful' remedies. This is another face of 'defensive' practice.

1.6.1.3.3 Patient pressure: Rarely, however, one may come across patients, some of them with half-knowledge, who insist on a prescription for antibacterials so as to "get better at the earliest" (because they are "very busy and have no time to lie down in bed") or to "avoid any hassles", particularly in cases of children and the elderly. Although in such situations it is the duty of the doctor to resist any such pressures, some doctors may yield to these pressures, often to appease the patients and to 'save' their practice.

1.6.1.3.4 Company pressure: With hundreds of pharmaceutical companies and thousands of medical representatives, it is natural to come under some pressure for prescribing these drugs, which earn handsome profits for the drug industry. ("Volume building products, Sir", the representative would tell us). With competition hotting up, the companies seem to mislead the doctors about the indications, suppress the facts on adverse effects and hide the facts on cost of therapy. Recently there is a dangerous trend of 'combining' antibacterial and marketing them for imaginary diseases. Many of the so called 'newer' antibiotics (which are in fact nothing more than modifications of existing molecules) are priced exorbitantly (even hundred times more than their older congeners) without offering any benefits over the older, time tested drugs. But it has become rather fashionable to prescribe these drugs, with many doctors feeling that 'costlier must be better'. [5]

1.6.1.4 The Three Most Common Situations for Antibiotic Abuse

It has been observed that the three commonest reasons for prescribing antibacterials are fever, sore throat and diarrhea. In all these three situations, antibiotics are most often prescribed unnecessarily. Viruses being more abundant, these diseases are also most often due to the viral infections and antibacterial have no role to play in their management. Use of antibacterial in non-bacterial illness results only in the destruction of susceptible bacteria and selective proliferation of resistant bacteria, thus aiding the propagation of bacterial drug resistance.

1.6.1.4.1 Fever

It is a manifestation of hundreds of diseases, infective and non-infective. Antibacterials DO NOT have any beneficial effects in cases of fever due to non-bacterial causes. Self-limiting viral infections are the commonest infectious causes for fever and Antibacterials have no role to play in their management, neither do they shorten the duration of the illness nor do they "prevent secondary infections". Premature, presumptive and indiscriminate use of Antibacterials in all cases of fever adds to the cost of therapy, adverse effects (ampicillin rash in infectious mononucleosis being a classic example!), development of drug resistance and may mask the signs of bacterial infection, making a proper diagnosis difficult. Therefore, the urge to prescribe antibacterial in all cases of fever should be curbed. All attempts should be made to localize the site and type of the infection. Empirical antibacterial therapy should be reserved only for emergencies. High grades of 'fever' may be managed with antipyretics like paracetamol or mefenamic acid (and not NSAIDs or their combinations, the 'wonder pills' for 'pain and fever'!) and it should never be forgotten that antimicrobials are NOT antipyretics.

1.6.1.4.2 Sore throat

It is probably the commonest illness where antibacterials are misused the most. Although it accounts for 13% of all office visits, it has been found in various studies that only 8 to 20% of persons with a sore throat make a visit to a general practitioner (and in the other 80-90% it cures spontaneously!). Streptococcal sore throat is almost unknown in children below the age of 2 years and uncommon below 4 years. Roughly 10 to 20% of persons who present to an out-patient department will have group A Streptococci on throat culture and the other 80 to 90% with a sore throat will have a negative throat culture. But using clinical judgment alone will mean that 20 to 40% (or even more) of this large group of persons will receive antibiotics. Randomized trials designed to show the benefits of antibiotics over aspirin or

acetaminophen in adults with sore throat have shown either no difference or a modest benefit. In most trials, the fever difference was one degree Celsius or less and it was not determined if patients felt this as an important difference. A survey of physicians in 17 European countries reported that fever in patients with tonsillitis resolved itself in two or three days, with or without antibiotic treatment. Therefore routine use of antibacterials in cases of sore throat is often uncalled for. [5]

1.6.1.4.3 Diarrhea

It is another condition where antibacterial are often over-prescribed. While there are many causes for diarrhea, infective and non-infective, the fact remains that most of them are self-limiting and require only adequate rehydration. In all doubtful cases, a stool examination should be done for ova, cyst, blood and hanging drop if cholera is suspected. Stool culture can be done in the presence of severe and/or bloody diarrhea, fever and systemic toxicity. Presence of polymorphonuclear leukocytes on Wright's or Methylene blue staining usually suggests infection with *Salmonella, Shigella,* invasive *E. coli*, *Yersinia*, or *E. histolytica*.

Indications for antimicrobial therapy in diarrheal diseases would include patients with high fever, bloody diarrhea, severe dehydration, systemic toxicity, extremes of age, malignancy, immune compromise, abnormal heart valve, vascular or cardiac prosthesis and hemolytic anemia, history of recent antibiotic use, recent travel, outbreak of food poisoning in the community and in patients suffering from Shigellosis, cholera, traveler's diarrhea, parasitic diarrheas and pseudomembranous enterocolitis.

The recent trend of the drug companies marketing combinations of quinolones and nitroimidazoles (like tinidazole) for "mixed diarrheas" should not only be discouraged, but also opposed.[6]

1.6.2 Painkillers

Pain relievers are medicines that reduce or relieve headaches, sore muscles, arthritis, or other aches and pains. There are many different pain medicines, and each one has advantages and risks. Some types of pain respond better to certain medicines than others. Each person may also have a slightly different response to a pain reliever. [8]

There are three main types of painkiller: non-steroidal anti-inflammatory drugs (NSAIDS), paracetamol and opioids. Each works in a different way. Most people only need to take painkillers for a few days or weeks at most, but some people need to take them for a long time.

1. ***Non-steroidal anti-inflammatory drugs (NSAIDS):*** Examples of NSAIDs include ibuprofen, diclofenac and naproxen. Aspirin is also an NSAID. However, it is mainly prescribed (in low doses) to help to keep the blood from clotting - for example, for people who have had a heart attack in the past.

2. ***Paracetamol***.

3. ***Weak opioids and strong opioids (sometimes called opiates):*** Examples of weak opioids include codeine and dihydrocodeine. Examples of strong opioids includemorphine, oxycodone, pethidine and tramadol. Many people who need strong opioids are in hospital.

Different types of painkillers are sometimes combined together into one tablet - for example, paracetamol plus codeine (co-codamol).

1.6.2.1 Mechanism of action of Pain Killers

NSAIDs work by blocking (inhibiting) the effect of chemicals (enzymes) called cyclo-oxygenase (COX) enzymes. COX enzymes help to make other chemicals called prostaglandins. Some prostaglandins are involved in the production of pain and inflammation at sites of injury or damage. A reduction in prostaglandin production reduces both pain and inflammation. Not all NSAIDs are exactly the same, and some work in slightly different ways from others. [9]

1.6.2.2 Long-Term Health Risks

There are a number of different kinds of prescription drugs that are highly addictive and have the potential for abuse. These include opiate painkillers (e.g., OxyContin, hydrocodone), central nervous system depressants (e.g., Xanax, Vicodin), and stimulants (e.g., Adderall, Ritalin). All of these drugs can be abused even by patients who have a legitimate prescription for their use and, over time, this can lead to a number of long-term health risks. Each drug

class comes with its own set of risks, but across the board, long-term users of prescription drugs will risk health problems that include:

- ✓ Organ damage and failure, especially to the kidneys and liver
- ✓ Tolerance to the medication characterized by needing more and more of the drug to experience its effects which leads to physical dependence
- ✓ Withdrawal symptoms when without the drug
- ✓ Increased mental health symptoms like paranoia and depression
- ✓ Decreased cognitive function

1.6.2.2.1 Long-Term Effects of Opiate Painkillers

Often prescribed to treat chronic pain, acute pain experienced after an injury or surgery, or cough (e.g., codeine cough syrup), opiate painkillers are the most commonly abused types of prescription drugs. Teens have easy access to these medications because they are so often prescribed – and over-prescribed – to adults, a practice that often results in "leftover" pills that are frequently stored in the medicine cabinet at home. Unfortunately, the short-term risks of use include overdose, especially when combined with alcohol, and long-term health risks include:

- ✓ Respiratory failure
- ✓ Intense withdrawal symptoms
- ✓ Addiction

1.6.2.2.2 Long-Term Effects of Central Nervous System (CNS) Depressants

Termed "central nervous depressants," these medications work by slowing down the brain's normal activity. They are often prescribed to patients who are unable to control rapid brain activity and experience anxiety, insomnia, seizures or panic attacks as a result. Included in this classification of prescription drugs are barbiturates (e.g., mephobarbital and sodium pentobarbital), benzodiazepines (e.g., Valium and Xanax), and sleep medications (e.g., Ambien and Lunesta). Deadly when abused or taken in large doses, they are also extremely dangerous when combined with other drugs, including alcohol. Some of the dangerous long-term health risks that those who abuse these medications should be concerned about include:

- ✓ Seizures
- ✓ Brain damage that affects motor function
- ✓ Loss of cognitive function
- ✓ Overdose
- ✓ Death
- ✓ Addiction

1.6.2.2.3 Long-Term Effects of Stimulants

Dextroamphetamine and methylphenidate are both commonly prescribed to teens who struggle with ADHD. In children, these medications provide a calming effect and aid in focus, but in adults, these medications have a stimulant effect that can be addictive and even deadly. Long-term use of the medication can cause health problems that include:

- ✓ Extreme weight loss
- ✓ Malnutrition
- ✓ Dehydration as well as a slew of related health problems
- ✓ Paranoia
- ✓ Chronic insomnia
- ✓ Death

1.6.2.3 Ongoing Risk of Overdose and Death

Many people are under the mistaken impression that those who are new to the use of prescription drugs are the most likely to experience an overdose or to die as a result of their drug use because they are unfamiliar with the medication and unsure what they're body can handle.

When ongoing drug use is a problem, body chemistry changes from day to day and yesterday's "normal" dose may be overwhelming today. Furthermore, the addition of other drugs makes the equation even less stable, and when under the influence, many teens incorrectly calculate the time between doses, which means they have more in their body than is manageable.

1.6.2.4 Addiction

Perhaps one of the biggest risks of long-term prescription drug abuse is addiction. Regular use of any addictive substance – even under the guidance of a medical professional – can lead to a physical dependence upon it. However, it is important to note that addiction is not the diagnosis until psychological cravings are also an issue. When your teen comes to feel that he "needs" to take a minimum dose of a certain substance daily or craves that drug around the clock, addiction is an issue and one that can only effectively be addressed at a medical treatment program. [10]

1.6.2.5 The Effects of Painkillers on the Brain and Body

Drug abuse of painkillers can cause harmful effects on the brain and body of the person using the substance. Painkillers can refer to a number of both over-the-counter (OTC), prescription and illicit drugs, but more often than not related to narcotic painkillers like Percocet, OxyContin and heroin. It is these narcotic painkillers that carry the highest risk of dependency and addiction.

Whether a painkiller is prescribed by a doctor or acquired on the street, these drugs can cause serious changes to the brain and body of the user. Although some damage can occur with short-term drug use, the most extreme or dangerous changes to the brain and body typically occurs with long-term use and abuse of painkillers.

Long-term use also increases the possibility of addiction and physical dependency on the drugs. After a while, users need these drugs just to keep away physical withdrawal symptoms and to physically feel normal. Painkillers are the second most abuse substances in the United States, ranking behind only marijuana use. [11]

1.6.2.6 Summary of long-term use of any type of painkillers on our body:

- ✓ **Can increase spread of common cold and flu:** Cold and flu is a common problem for which people take painkillers. But next time you think of taking a pill, give it another thought. Here's why: A study published in Proceedings of the Royal Society B showed that use of painkillers to curb flu fever could in turn worsen the condition for everybody else. The study, with the help of a mathematical model, proposed that painkillers might instead be increasing transmission of flu by up to 5 percent.

- ✓ **Worsens headache:** According to the National Institute for Health and Clinical Excellence (NICE) people who take painkillers like paracetamol, aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen for relieving headache (for more than 15 days in a month) are in reality the victims of overuse of drugs. Such people end up having more severe headache as time passes.

- ✓ **Increases the risk of heart attack and stroke:** A study by researchers from Copenhagen University Hospital, Demark showed that Ibuprofen can increase the

risk of early death in patients who have survived a heart attack. Study participants who had taken at least one NSAID medication within a year of suffering a heart attack were almost 59 percent more likely to die of subsequent heart attack or stroke than participants who did not take them.

- ✓ **Leads to depression:** Depression is a term that you generally associate with prolonged sadness and probably chronic stress. But you never know, taking a painkiller could be the reason behind your depression. Researchers have found that people using pain relievers like opioid analgesics for a prolonged period are at higher risk of developing depression.

- ✓ **Causes kidney damage:** Everydrug you take is ultimately released in the blood stream and finally eliminated after getting filtered from the kidneys. During the process of filtration, a drug can either interfere with the flow of blood to the kidneys, can cause an allergic reaction or can even cause direct injury to the kidney nephrons. According to a study over-the-counter as well as prescription medications lead to about 20 percent of cases of acute kidney failure.

- ✓ **Can lead to addiction:** Drug addiction is a big issue worldwide and it's common to hear about substance abuse, marijuana abuse etc. But misuse of painkillers is alarming in the U.S., especially among teenagers. Addiction to prescription medications is can lead to death and even doctors warn that painkiller abuse is one of the most difficult drug addictions to treat.

So, the best way to avoid addiction and other negative effects of painkillers on the body is to stop using them indiscriminately. [13]

1.6.2.7 Side effects of painkillers [14]

1.6.2.7.1 Morphine type drugs

Morphine type drugs (called opioids) can cause

- Constipation
- Feeling sick
- A dry mouth
- Itchy skin
- Blurred vision
- Difficulty passing urine

1.6.2.7.2 Anti inflammatory drugs

Anti inflammatory drugs can irritate your stomach and bowel (digestive system). If you take them without anything to protect your stomach, they can cause stomach bleeding or ulcers. They can also slow down the time your blood takes to clot. So if you have any bleeding or clotting problems your doctor may not use these drugs. Some types can affect the ways that your kidneys work.

1.6.2.7.3 Steroids

- Having more of an appetite
- Having more energy
- Difficulty sleeping
- Indigestion
- Raised blood pressure
- Raised blood sugar
- Sugar in your urine
- Loss of strength in muscles

1.6.2.7.4 Anti epileptic drugs

Drugs that prevent fits can also have side effects. Depending on the drug, these can include

- Difficulty sleeping
- Tiredness
- Dizziness
- Loss of appetite
- Feeling sick

1.6.2.7.5 Anti depressants

Different anti depressants have different side effects. They can cause

- A dry mouth
- An increase or decrease in appetite
- Changes to your sleep pattern
- Drowsiness

1.6.3 Acid reducing agent

1.6.3.1 Gastric acidity

Acidity refers to a set of symptoms caused by an imbalance between the acid secreting mechanism of the stomach and proximal intestine and the protective mechanisms that ensure their safety. The stomach normally secretes acid that is essential in the digestive process. This acid helps in breaking down the food during digestion. When there is excess production of acid by the gastric glands of the stomach, it results in the condition known as acidity. However, there are certain types of ulcers where acid secretion is either normal or even low. Acidity is responsible for symptoms like dyspepsia, heartburn and the formation of ulcers (erosion of the lining of the stomach or intestines). Acidity tends to have a much higher incidence in highly emotional and nervous individuals.

1.6.3.2 Treatment

Identifying and avoiding the causative factors are essential in the treatment of acidity. A suitable diet must be strictly followed avoiding spicy, salty and acidic foods. Smoking and alcohol consumption must be stopped. Antacids provide immediate relief of symptoms by neutralizing the excess acid secreted. A group of drugs called H_2 Receptor Blockers cause the stomach to produce less acid by blocking histamine receptors (example: Drugs like Cimetidine , Ranitidine, Famotidine or Nizatidine). Another group of drugs called the Proton Pump Inhibitors, which selectively disable a mechanism in acid-making cells thus stopping acid production are more powerful and include Omeprazole and Lansoprazole. If ulcers have developed, they must be diagnosed rapidly and treated to prevent complications like perforations. Long term therapy lasting for weeks may be required to produce complete healing. Surgical methods of reducing the acid secretion like Vagotomy are being used with decreasing frequency. [15]

1.6.3.3 Proton pump inhibitors (PPIs)

PPIs are a group (class) of medicines that work on the cells that line the stomach, reducing the production of acid. They include esomeprazole, lansoprazole, omeprazole, pantoprazole and rabeprazole, and have various different brand names.

1.6.3.3.1 Adverse effects

Because proton pump inhibitors decrease the acidity of the stomach, the main concern from the effect of profound acid suppression is hypergastrinaemia. Patients receiving a PPI are also susceptible to the colonization of ingested pathogens which can lead to bacterial gastroenteritis. The US Food and Drug Administration (FDA) just recently announced that overexposure or prolonged use of a proton pump inhibitor may be associated with a higher risk of infection by the deadly bacteria Clostridium Difficile (CDAD). Evidence shows there is a distinct link between prolonged gastric acid suppression, hypergastrinaemia and neuroendocrine cell hyperplasia, which may allow the production of carcinogenic substances.

Due to the fact that proton pump inhibitors are commonly prescribed to regulate and prevent symptoms of a chronic implacable condition, it is probable that the duration of therapy may exceed more than four years. This prolonged treatment is believed to hinder calcium absorption in the small intestine. The ability of the small intestine to absorb calcium salts is highly pH dependent, and since proton pump inhibitors cause an increase in gastric pH, calcium salts are rendered insoluble and cannot be absorbed. This inhibition of calcium absorption has a direct correlation to osteoporotic fractures in those individuals taking a PPI. A study conducted in Canada determined that after seven years of continuous exposure to a PPI, there was a statistically significant increase in osteoporosis-related fractures, and an increase risk of hip fracture after five years. As bone mineralization and resorption takes many years, and because of the subtle effect that proton pump inhibitors have on bone mineralization, several years may be required before it has a measurable clinical outcome. [16]
Most people who take a PPI do not have any side-effects. However, side-effects occur in a small number of users. The most common side-effects are:

- ✓ Constipation
- ✓ Diarrhoea
- ✓ Wind (flatulence)
- ✓ Headaches
- ✓ Feeling sick (nausea)
- ✓ Tummy (abdominal) pain
- ✓ Being sick (vomiting) [25]

1.6.3.3.2 Overuse

Taking a PPI makes sense if you have a chronic problem with stomach acid or the prospect of one developing. But the occasional case of mild heartburn does not need to be treated with aPPI. For that kind of spot duty, the old standbys of antacid medicine like Tums, Rolaids, and Maalox will most likely work just as well, as will any of the H2 blockers. In fact, it takes several days for PPIs to have their full effect on acid secretion, so an H2 blocker may be more effective for a mild, short-term problem with stomach acid. Yet people often take PPIs under the mistaken assumption that they are the better medication in all circumstances. The fact that omeprazole is available as a generic has narrowed the cost difference, but you're still probably going to pay more for a PPI, and most definitely so if you are taking one of the expensive brand-name varieties.

If heartburn is the problem, there are also changes you can make that may help that don't involve taking anything. The commercials are right: gobbling down a large meal can give you heartburn, so eating smaller meals can help tame the problem. You can also try cutting back on alcohol. And if you're heavy, GERD and heartburn are on that very long list of problems that ease up and may even go away if you lose some weight. [26]

1.6.3.4 H_2 Blockers

H2 blockers reduce the amount of acid made by your stomach. They are used in conditions where it is helpful to reduce stomach acid. For example, for acid reflux which causes heartburn. Most people who take H2 blockers do not develop any side-effects. [27]

1.6.3.4.1 Side Effects

Along with its needed effects, a medicine may cause some unwanted effects. Although not all of these side effects may occur, if they occur they may need medical attention. [28]

Check with your doctor as soon as possible if any of the following side effects occur:

- ✓ Abdominal pain
- ✓ back, leg, or stomach pain
- ✓ bleeding or crusting sores on lips
- ✓ blistering, burning, redness, scaling, or tenderness of skin
- ✓ blisters on palms of hands and soles of feet
- ✓ changes in vision or blurred vision

- ✓ confusion
- ✓ coughing or difficulty in swallowing
- ✓ dark-colored urine
- ✓ dizziness
- ✓ fainting
- ✓ fast, pounding, or irregular heartbeat
- ✓ fever and/or chills
- ✓ flu-like symptoms
- ✓ general feeling of discomfort or illness
- ✓ inflammation of blood vessels
- ✓ joint pain
- ✓ light-colored stools
- ✓ muscle cramps or aches
- ✓ nausea, vomiting, or loss of appetite
- ✓ pain
- ✓ peeling or sloughing of skin
- ✓ red or irritated eyes
- ✓ shortness of breath
- ✓ skin rash or itching
- ✓ slow heartbeat
- ✓ sore throat
- ✓ sores, ulcers, or white spots on lips, in mouth, or on genitals
- ✓ sudden difficult breathing
- ✓ swelling of face, lips, mouth, tongue, or eyelids
- ✓ swelling of hands or feet
- ✓ swollen or painful glands
- ✓ tightness in chest
- ✓ troubled breathing
- ✓ unusual bleeding or bruising
- ✓ unusual tiredness or weakness
- ✓ unusually slow or irregular breathing
- ✓ wheezing
- ✓ yellow eyes or skin

1.6.3.5 Antacid:

Antacids are agents that neutralize the gastric acid and raise the gastric pH, so are used to treat dyspepsia and are used as symptomatic relief of peptic ulcer. Antacids in common use salts of magnesium, aluminium and calcium. Some mixtures contain sodium and should be used with caution in patients who should avoid excess sodium intake. Alginates are sometimes combined with antacids for use in gastroesophageal reflux disease. Alginates float on top of the gastric contents and act as a barrier between the acidic contents of the stomach and the lower esophageal sphincter, preventing erosion of the lower esophagus and therefore not creating the pain experienced in gastroesophageal reflux disease. [18]

1.6.3.5.1 Possible side effects of antacids

Like all medicines, antacids can have side effects. Common side effects include:

- ✓ diarrhoea
- ✓ constipation
- ✓ flatulence
- ✓ stomach cramps
- ✓ feeling sick or vomiting [19]

Extra doses:

Taking extra doses could cause several unpleasant side effects, such as nausea, vomiting, diarrhoea and constipation.

1.6.4 What it should be

1.6.4.1 Antibiotic Use

WHO advocates 12 key interventions to promote more rational use of antibiotic:

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

8. Use of independent information on medicines
9. Public education about medicines
10. Avoidance of perverse financial incentives
11. Use of appropriate and enforced regulation
12. Sufficient government expenditure to ensure availability of medicines and staff.[1]

1.6.4.1.1 Control of use of antimicrobial agents: The following methods can be used to control the use of antimicrobial agents in hospitals:

- ✓ Education programs like staff conferences,
- ✓ Lectures and audiovisual programs;
- ✓ Availability of clinical pharmacist consultants;
- ✓ Restriction of hospital formulary to minimum number of agents needed for most effective therapy;
- ✓ Availability of diagnostic microbiology laboratory sensitivity tests and appropriate selection of sensitivity tests for organism and site.[2]

It is important to understand that, although they are very useful drugs, antibiotics designed for bacterial infections are not useful for viral infections such as a cold, cough, or the flu.

1.6.4.1.2 Indications for antibacterial therapy:

Definitive therapy: This is for proven bacterial infections. Antibiotics (read antibacterials) are drugs to tackle bacteria and hence should be restricted for the treatment of bacterial infections only. This may sound silly, but most doctors seem to forget this simple fact! Attempts should be made to confirm the bacterial infection by means of staining of secretions/fluids/exudates, culture and sensitivity, serological tests and other tests. Based on the reports, a narrow spectrum, least toxic, easy-to-administer and cheap drug should be prescribed.

Empirical therapy: Empirical antibacterial therapy should be restricted to critical cases, when time is inadequate for identification and isolation of the bacteria and reasonably strong doubt of bacterial infection exists: septicemic shock/ sepsis syndrome, immunocompromised patients with severe systemic infection, hectic temperature, neutrophilic leukocytosis, raised ESR etc. In such situations, drugs that cover the most probable infective agent/s should be used.

Prophylactic therapy: Antimicrobial prophylaxis is administered to *susceptible patients* to prevent *specific infections* that can cause *definite* detrimental effect. These include antitubercular prophylaxis, anti rheumatic prophylaxis, anti endocarditis prophylaxis and prophylactic use of antimicrobials in invasive medical procedures etc. In all these situations, only narrow spectrum and specific drugs are used. It should be remembered that there is NO single prophylaxis to 'prevent all' possible bacterial infections.

Compromised immune status:

In patients with extremes of age, HIV infection, diabetes mellitus, neutropenia, splenectomy, using corticosteroids or immunosuppressants, patients with cancers / blood dyscrasias, ONLY bactericidal drugs should be used. And it is indeed debatable whether antibacterials should be used to treat infections like aspiration pneumonia, UTI, catheter infections, infections through life support systems, pressure sores etc. in patients who are terminally ill (brain dead, patients with massive stroke, terminal cancers, advanced age, terminal AIDS etc.).

Pregnancy*:*

Drugs with known toxicity or un-established safety like tetracyclines, quinolones, streptomycin, erythromycin estolate and clarithromycin are contraindicated in all trimesters and sulfa, nitrofurantoin and chloramphenicol are contraindicated in the last trimester. Drugs with limited data on safety like aminoglycosides, azithromycin, clindamycin, vancomycin, metronidazole, trimethoprim, rifampicin and pyrazinamide should be used with caution when benefits overweigh the risks. Penicillins, cephalosporins, INH and ethambutol are safe in pregnancy. In lactating mothers sulfa, tetracyclines, metronidazole, nitrofurantoin and quinolones are contraindicated.

Renal failure:

Tetracyclines are absolutely contraindicated; aminoglycosides, cephalosporins, fluoroquinolones and sulfa are relatively contraindicated; and penicillins, macrolides, vancomycin, metronidazole, INH, ethambutol and rifampicin are relatively safe. It is better to avoid combinations of cephalosporins and aminoglycosides in these patients because both these classes of drugs can cause nephrotoxicity.

Hepatic failure:

No drugs are absolutely contraindicated; chloramphenicol, erythromycin estolate, fluoroquinolones, pyrazinamide, rifampicin, INH and metronidazole are relatively contraindicated and penicillins, cephalosporins, ethambutol and aminoglycosides are safe.

1.6.4.1.3 Drug factors

Hypersensitivity: If the patient has prior history of hypersensitivity the concerned antibacterial agent should be avoided. It is therefore important to elicit this history in all patients.

Adverse reactions: Certain adverse reactions warrant discontinuation of therapy and the doctor should adequately educate the patients on these adverse effects.

Interactions: Interactions with food and other concomitant drugs should be considered before instituting antibacterial therapy so as to maximize efficacy and minimize toxicity

Cost: Lastly, but not the least, the cost of therapy should be considered in choosing the antibacterial agent and in a developing country like India with limited spending on healthcare, this does assume significance. It should always be remembered that just because a particular drug is expensive, it need not be superior than the cheaper ones. For example, cheaper drugs like doxycycline or co-trimoxazole would be as effective as the costlier clarithromycin or cephalosporins in the management of LRTI. [2]

1.6.4.1.4 Missing a dose of antibiotics

If you forget to take a dose of your antibiotics, take that dose as soon as you remember and then continue to take your course of antibiotics as normal.

However, if it is almost time for the next dose, skip the missed dose and continue your regular dosing schedule. Do not take a double dose to make up for a missed one.

1.6.4.1.5 Accidentally taking an extra dose

Accidentally taking one extra dose of your antibiotic is unlikely to cause you any serious harm.

However, it will increase your chances of experiencing side effects such as pain in your stomach, diarrhoea and feeling or being sick. [4]

1.6.4.2 Uses of painkillers

Painkillers should be avoided by people with certain health conditions, such as a current or recent stomach ulcer, or a history of bad reactions to NSAIDs.

It should be used with caution by older people, and people with certain health conditions, including asthma or kidney or liver problems. Ideally, pregnant women should not take ibuprofen unless recommended by a doctor.

Ibuprofen can also interact with a range of other medicines. It is important to check that it is safe to take ibuprofen alongside these medications by asking doctor, pharmacist or checking the patient information leaflet. [5]

1.6.4.2.1 Paracetamol

Paracetamol should be used with caution in people who have:

- ✓ liver problems
- ✓ kidney problems
- ✓ alcohol dependence
- ✓ long-term malnutrition or dehydration

1.6.4.2.2 Use in children

Babies and children can be given paracetamol to treat fever or pain if they are over two months old. High doses of paracetamol (500mg or more) are not licensed for children under 16 years old and should not be given to children under 12 years old.

Check the packet or patient information leaflet to make sure that the medicine is suitable for children and to find out the correct dose. When paracetamol is given to babies or children, the correct dose may depend on:

- the child's age
- the child's weight
- the strength of the paracetamol - this is usually in milligrams (mg) [7]

1.6.4.3 Gastric Reducing Agents

1.6.4.3.1 Proper Use of H_2 blockers

For patients taking the nonprescription strengths of these medicines for heartburn, acid indigestion, and sour stomach:

- ✓ Do not take the maximum daily dosage continuously for more than 2 weeks, unless directed to do so by your doctor.
- ✓ If you have trouble in swallowing, or persistent abdominal pain, see your doctor promptly. These may be signs of a serious condition that may need different treatment.
- ✓ For patients taking the prescription strengths of these medicines for more serious problems:
    - One dose a day—Take it at bedtime, unless otherwise directed.
    - Two doses a day—Take one in the morning and one at bedtime.
    - Several doses a day—Take them with meals and at bedtime for best results.

It may take several days before this medicine begins to relieve stomach pain. To help relieve this pain, antacids may be taken with the H2-blocker, unless your doctor has told you not to use them.

For patients taking chewable tablets:

- Chew the tablets well before swallowing.

For patients taking oral disintegrating tablets:

- Make sure your hands are dry.
- Leave tablets in unopened package until the time of use, then open the pack and remove the tablet.
- Immediately place the tablet on the tongue.
- The tablet will dissolve in seconds, and you may swallow it with your saliva. You do not need to drink water or other liquid to swallow the tablet.

For patients taking effervescent tablets:

- Do not chew, swallow whole or dissolve on the tongue.
- Remove the foil wrapping and dissolve the 150-mg tablet in 6 to 8 ounces of water before drinking.
- For infants and children: Dissolve the 25-mg tablet in no less than 5 mL (1 teaspoonful) of water in a dosing cup. Wait until the tablet is completely dissolved before administering the solution to the infant or child. You may give the medicine to your infant by dropper or oral syringe. Ask your doctor if you are unsure how much medicine to give your infant.[8]

1.6.4.3.2 Proper Use of antacids

Antacids are often taken to relieve symptoms or when symptoms are expected. Your doctor or pharmacist will advise you of the dose needed and how often you should take it. Read the leaflet that comes with your particular brand for further information.

Your doctor may prescribe an antacid to have on standby so that you only take it to relieve your symptoms when they occur, rather than every day. Read the leaflet that comes with your particular brand for further information. [9]

1.6.4.3.3 Proper Use of proton pump inhibitors (PPIs)

Your doctor will advise you of the dose needed and how often you should take it. Some of these medicines need to be taken in a certain way, such as on an empty stomach. Therefore, read the leaflet that comes with your particular brand for further information.

Chapter Two

Literature Review

2.1 Intervention Research in Rational Use of Drugs

Many studies have been done to document drug use patterns, and indicate that overprescribing, 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 50 intervention studies to improve drug use in developing countries. It highlights what type of interventions exists and what is known about their impact. [25]

2.2 Rational Use of Drugs and Irrational Drug Combinations

Irrational use of Medicines is a global phenomenon. Rational use of drugs may be defined as: 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. Overuse, polypharmacy and incorrect use of drugs are the most common problems of drug use today. Irrational use of drugs may result due to various reasons at various levels including the prescribing errors and over the counter drugs. Irrational use of medicines may lead to serious negative health and economic consequences. Many irrational drug combinations are available in Indian market. Proper implementation of rational use of drugs will improve the quality of life and result in better community healthcare. [26]

2.3 Health technology and pharmaceuticals, essential medicines: access, quality and rational use

The world pharmaceutical market has witnessed an increase in the number of pharmaceutical products circulating worldwide, leading to a rapid growth in both medicine consumption and expenditures. However, WHO estimates that, as of 1997, at least one-third of the world's population still lacks access to essential medicines, either because these are not available or are too expensive, or because there are no adequate facilities or trained professionals to prescribe them. In poorer areas of Asia and Africa this figure may be as high as one-half. As a result, millions of children and adults die or suffer needlessly, although their diseases could have been prevented or treated with cost-effective and inexpensive essential medicines.[27]

2.4 Availability and rational use of drugs in the PHC facilities following National Drug Policy of 1982: Is Bangladesh on right track?

In Bangladesh, the National Drug Policy (NDP) of 1982 was instrumental in improving the supply of quality essential drugs at an affordable price, especially in the early years. However, over time, evidences exist about the deterioration of situation both in terms of availability of essential drugs as well as rational use of drugs. A recent study examined the current status in terms of availability, affordability and rational use of drugs in the primary healthcare (PHC) facilities in Bangladesh. The study covered a random sample of Upazila Health Complexes (UHC) in the rural areas (n=30) and a convenient sample of Urban Clinics (UC) in the Dhaka Metropolitan area (n=20). Observation, exit-interview and mini-market survey were done to collect data on WHO core drug use indicators in health facilities.[28]

Chapter Three

Methodology

3. Methodology

3.1 Types of Study

The methodology of this report is totally different from conventional reports. I have emphasized on the practical observation. Almost the entire report consists of my practical observation.

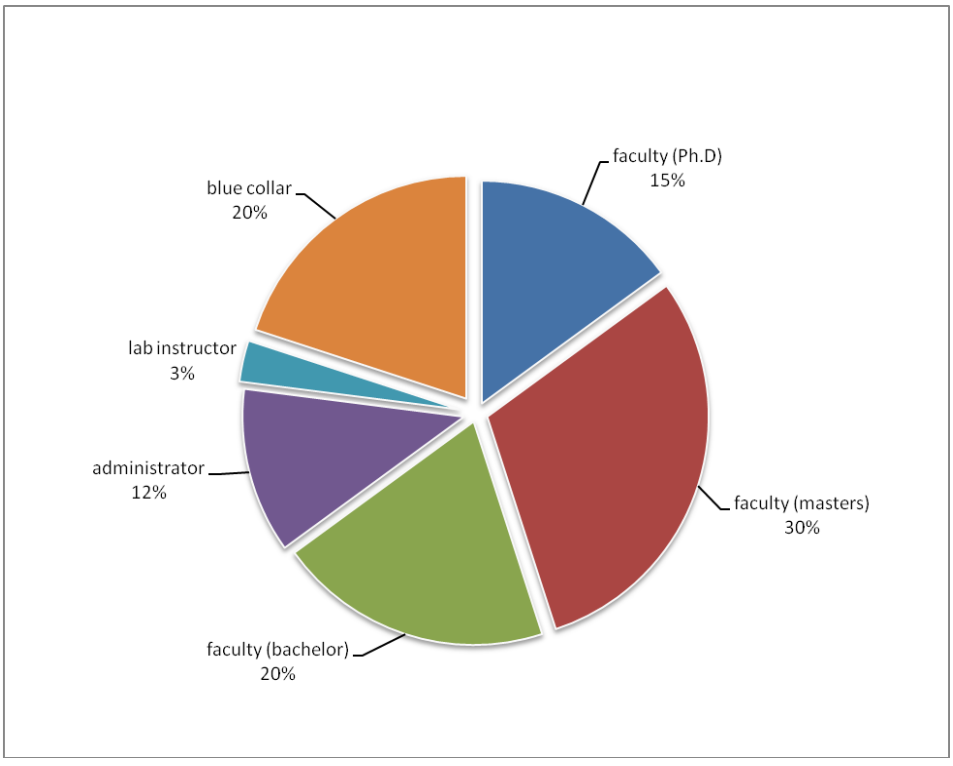
3.2 Sources of Data

The report is fully exploratory in nature. Data have been collected solely from primary sources which were done by Face to face conversation with the company officers and staffs.

3.3 No. of people:

a. Faculty Member (Ph.D) : 15
b. Faculty Member (Masters) : 30
c. Faculty Member (Bachelor) : 20
d. Administrator : 12
e. Lab instructor : 3
f. Blue collars : 20

Total → 100



3.4 Methods of Data Collection

The data have been used in this study are basically collected informally. This is totally an explorative study. As a result, data are collected by studying and reviewing the statement provided by the stuffs through some specific questionnaires. The relevant data was collected by informal discussion with the company officials regarding their tendency of using different types or classes of medicines, mainly rational uses of critical medicines like antibiotics, pain killers, gastric reducing agents etc.

3.5 Questionnaires

Department of Pharmacy, Daffodil International University, Dhaka

SCENARIO OF AWARENESS ABOUT RATIONAL USE OF MEDICINE

Investigator: ..... **Supervisor: KH Ahammad Uz Zaman, Lecturer, DIU**

Name:

Educational qualification:

1. Any disease suffering from last 2 years: fever / jaundice/ pneumonia / others.....
2. Drug prefers from : prescription/ pharmacy/ online suggestion/ Self medication
3. Any major disease suffering from in life: heart/ kidney/ brain/ lungs/ others.....
4. Did you take any antibiotics during last 2 years? Yes / No. If yes, than which one.....
5. Did you complete full course of antibiotic? Yes/ No
6. Did you take antibiotic or other drugs timely? Yes/ No
7. Do you know anything about antibiotic resistant? Yes/ No
8. What do you usually do if you mistake any dose?

   ○ Take whenever you remember ○ Don't take the dose

   ○ Take the missing dose with next dose ○ Others.....
9. Do you normally maintain follow ups? Yes / No
10. Do you know that gastric medication should be taken with pain killers? Yes / No
11. If you suffer from minor disease like fever, headache, diarrhea do you –

    ○ Visit doctor? ○ Take medicine by your own? ○ Others.....
12. Do you read the leaflet given with the medicine? Yes/ No
13. Do you -

    - Prefer medicine of any reputed company? or

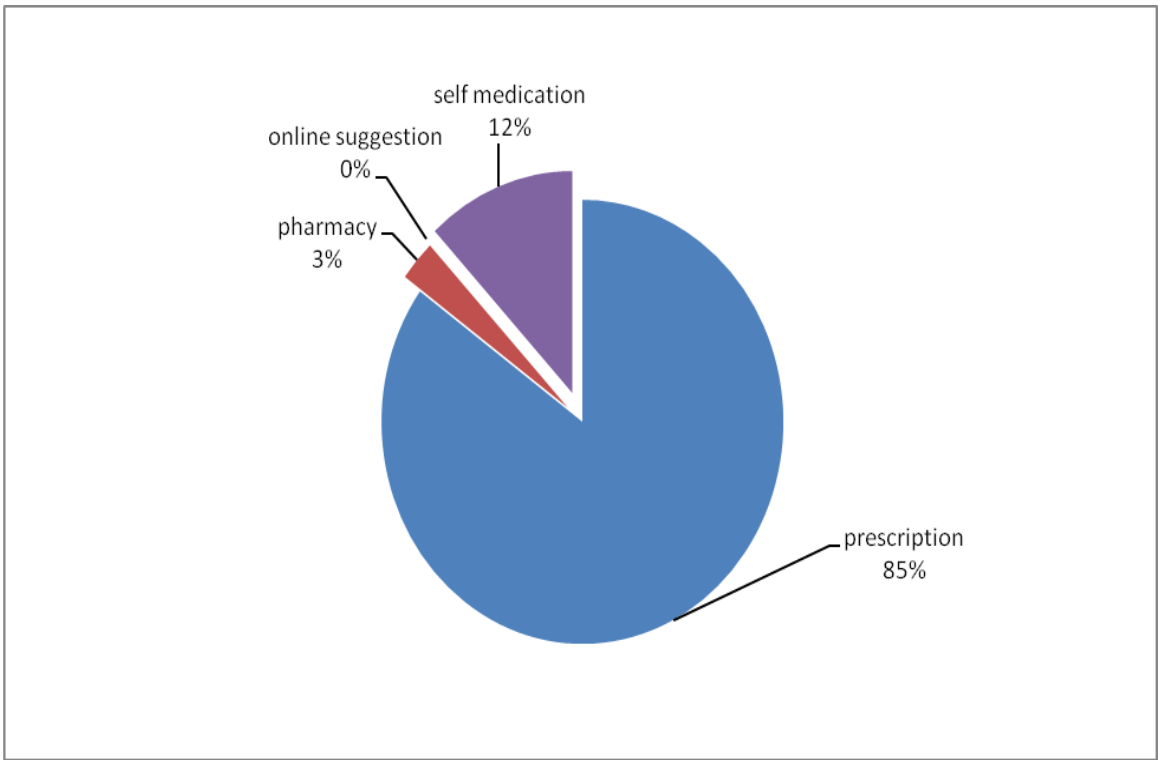
    - Strictly follow the doctor's prescription?
14. Do you know anything about drug interactions? Yes/ No
15. Do you search for information about the drug's side effect before taking drug? Yes/No

Chapter Four

Result & Discussion

4.1 Percentage of people based on preference of taking drug from different sources

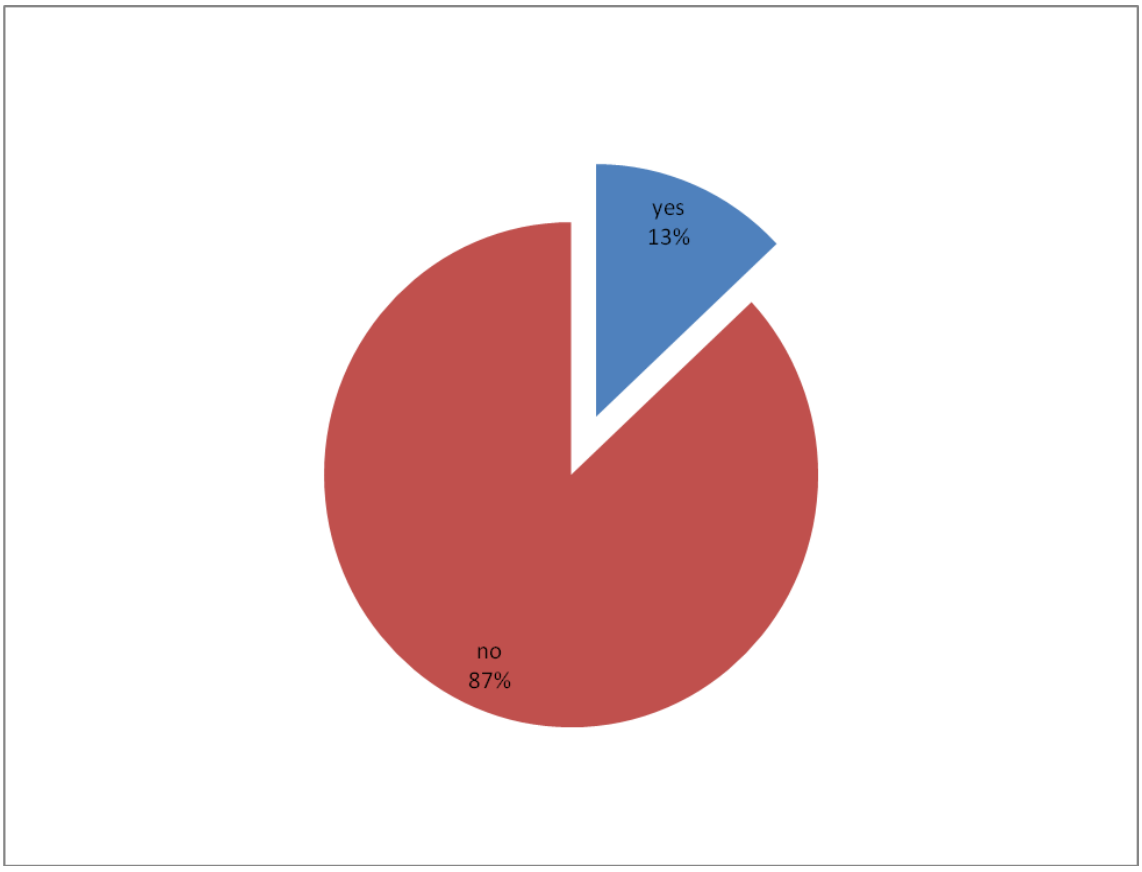
Sources	No. of people	% of people
Prescription	85	85%
Pharmacy	3	3%
Online suggestion	0	0%
Self medication	12	12%



From the findings it might be said that most of the studied persons use medication rationally. But there are few who although are highly educated don't always took medication properly or rationally. Self medication is the worst scenario of irrational use of medicines now a day which some of the studied persons practice.

4.2 Percentage of people suffering from major disease during last two years

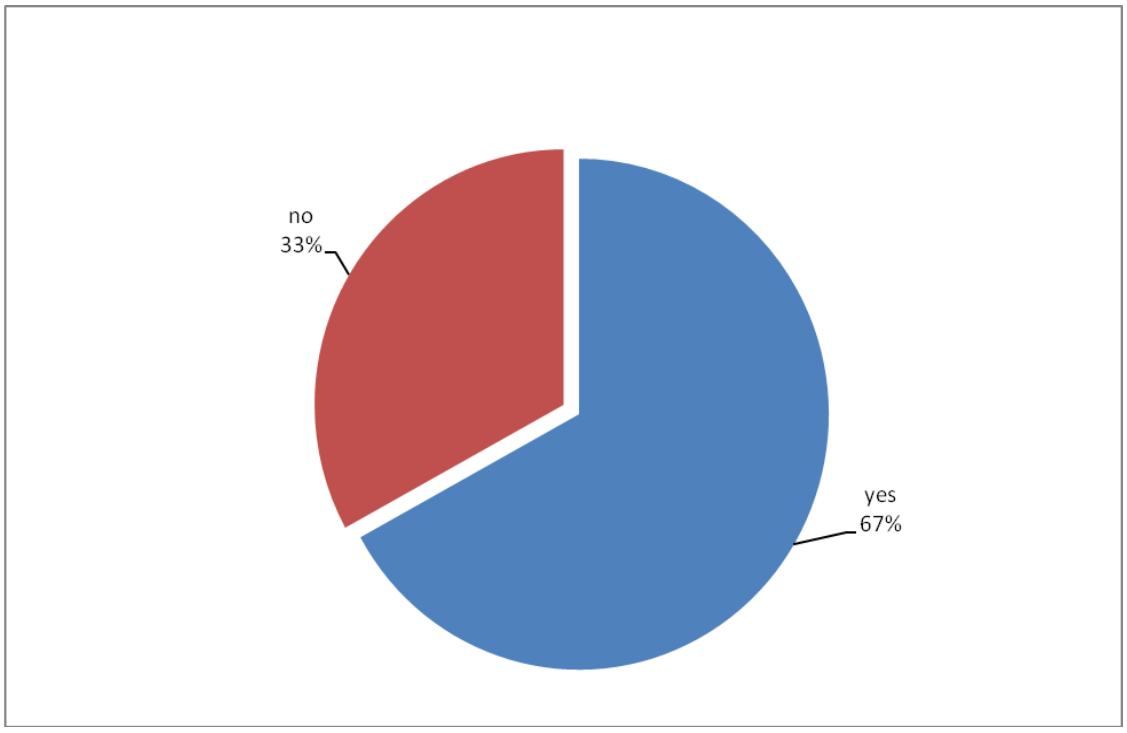
Answer	No. of people	% of people
Yes	13	13%
No	87	87%



From the findings it might be said that majority of people didn't suffer from major disease in last two years. Only a few people suffered from major disease during last two years.

4.3 Percentage of people taking antibiotic during last 2 years

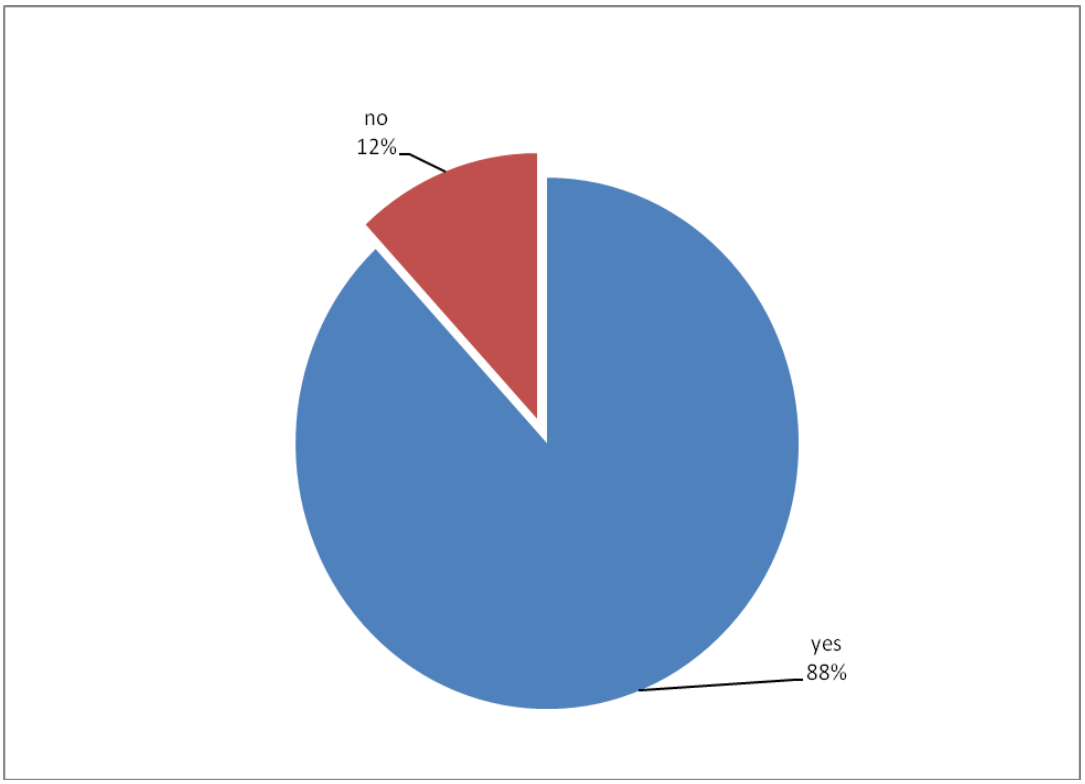
Answer	No. of people	% of people
Yes	67	67%
No	33	33%



From the findings it might be said that majority of people have taken antibiotic during last two years where only few people didn't take antibiotic.

4.4 Among the people that took antibiotic percentage of people who complete antibiotic course:

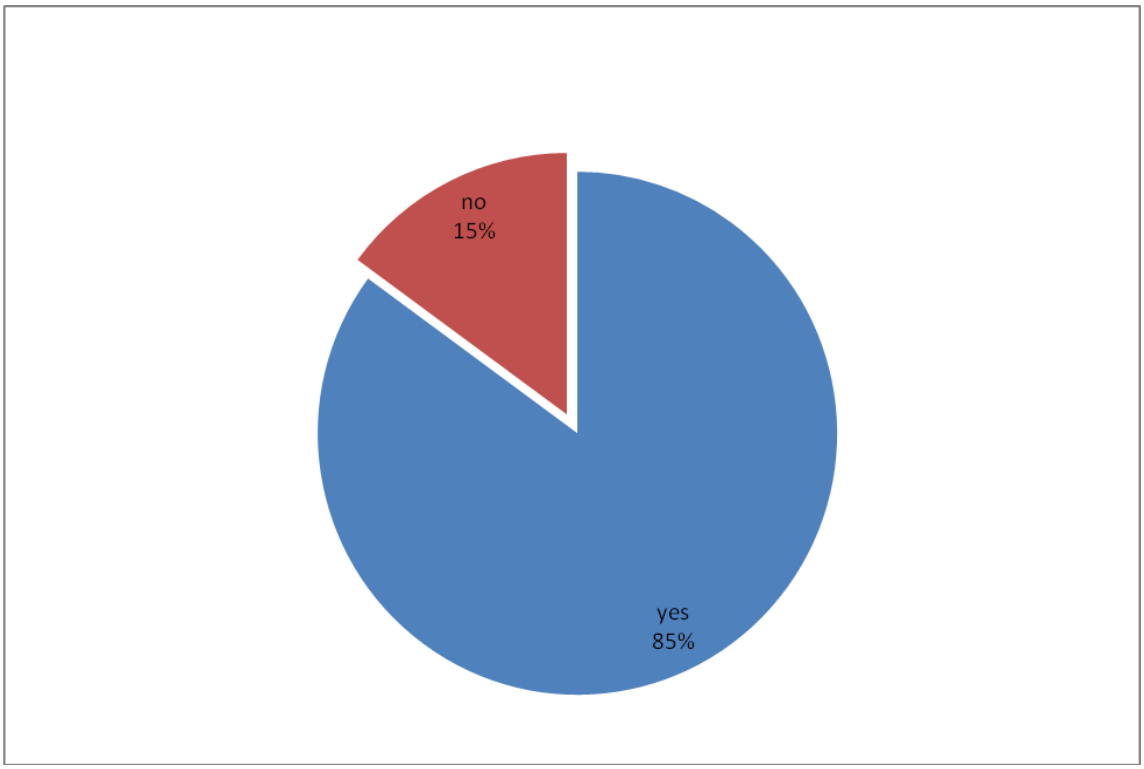
Answer	No. of people	% of people
Yes	59	88%
No	8	12%



From the findings it might be said that people who took antibiotic among them most of the people complete antibiotic course. But there are few people who didn't complete their antibiotic course.

4.5 Percentage of people taking drug (Antibiotics) timely

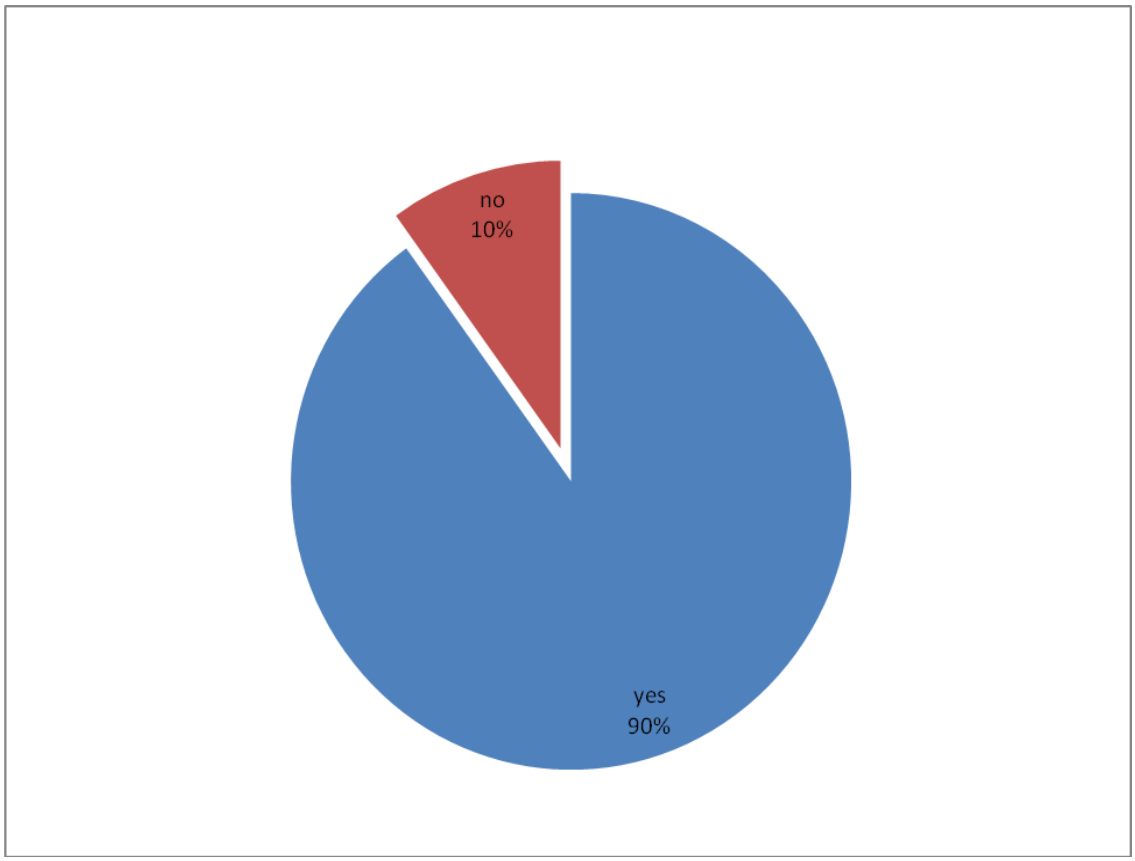
Answer	No. of people	% of people
Yes	57	85%
No	10	15%



From the findings it might be said that most of the people take drugs timely but there are also a number of people who don't take drugs timely.

4.6 Percentage of people aware of antibiotic resistance :

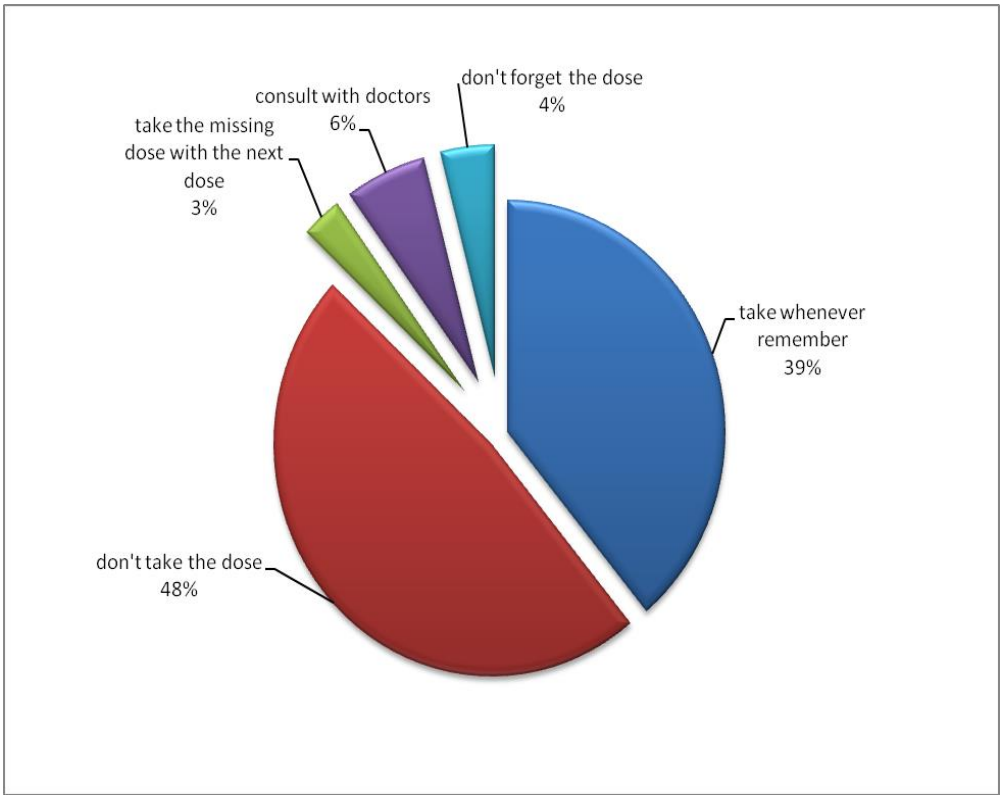
Answer	No. of people	% of people
Yes	90	90%
No	10	15%



From the findings it might be said that majority of people know about antibiotic resistant though there are a few people who don't know about antibiotic resistant.

4.7 Usual activities when they miss any dose :

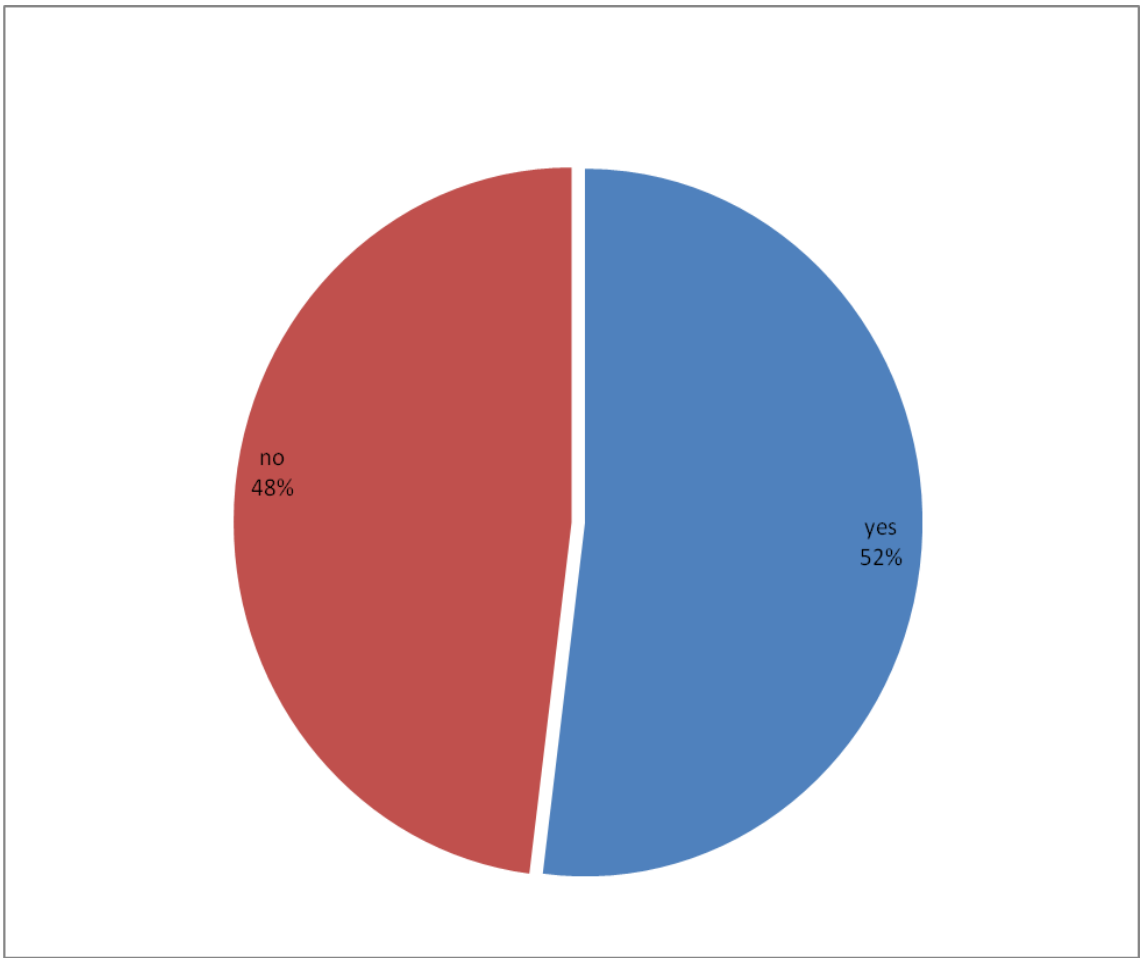
Answer	No. of people	% of people
Take whenever remember	39	39
Don't take the dose	48	48
Take the missing dose with next dose	3	3
consult with doctors	6	6
don't forget dose	4	4



From the findings it might be said that majority of people don't take the dose when they miss any dose. There are also a lot of people who take the missing dose whenever they remember. Very few people take the missing dose with the next dose. Some people consult with doctor if they forget any dose and some people never forget to take the dose.

4.8 Percentage of people maintaining follow ups according to doctor's advice

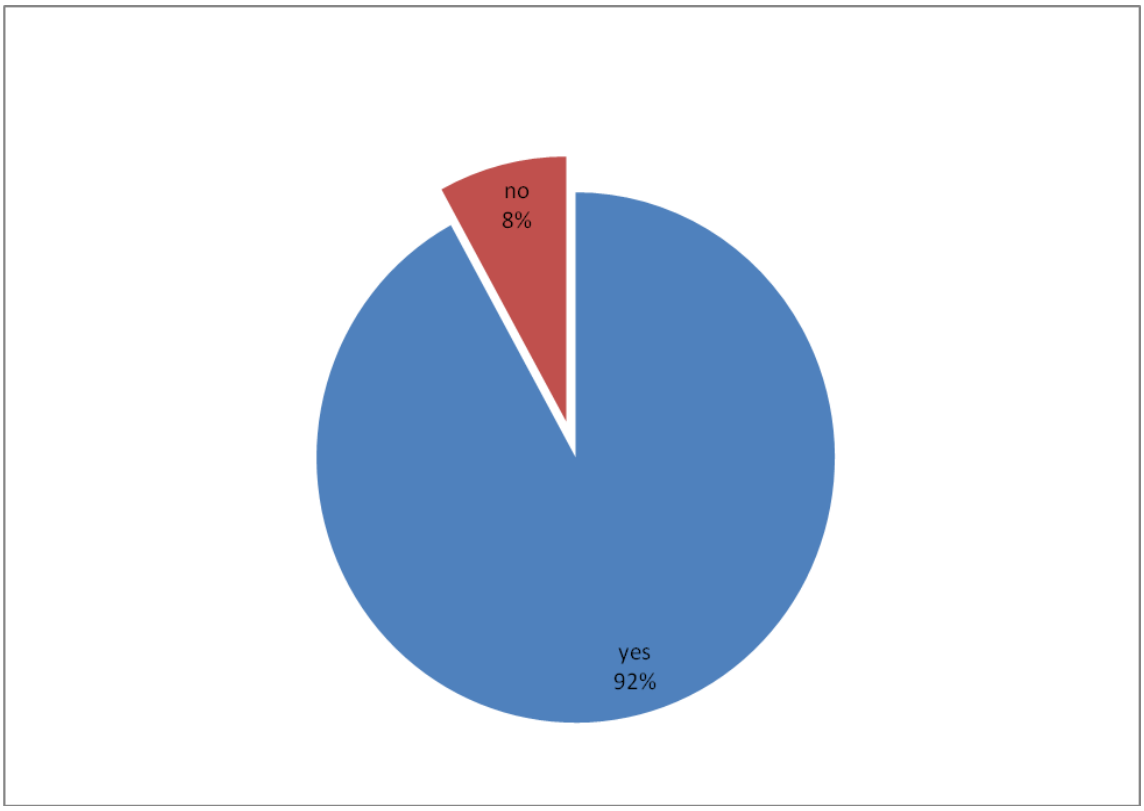
Answer	No. of people	% of people
Yes	52	52%
No	48	48%



From the findings it might be said that majority of people maintain follow ups according to doctor's advice but there are also lots of people who don't maintain follow ups.

4.9 Percentage of people who has awareness about taking gastric reducing medication with the pain relieving treatment

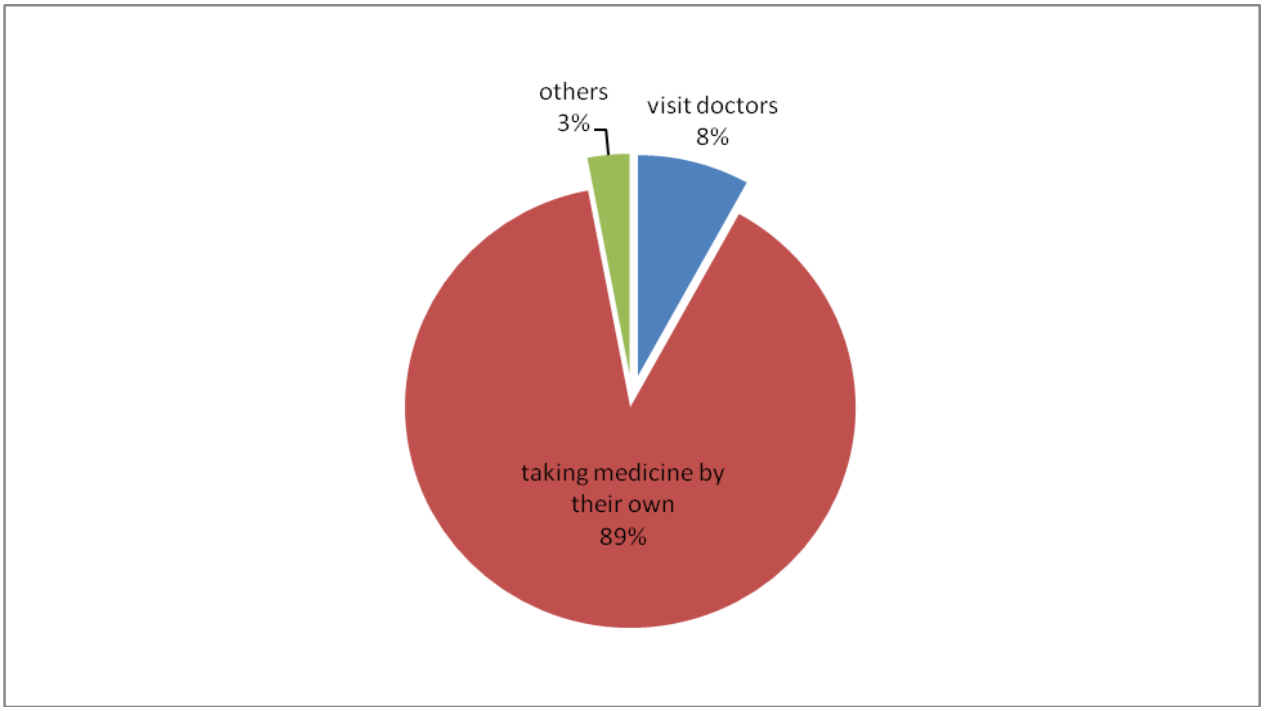
Answer	No. of people	% of people
Yes	92	92%
No	8	8%



From the findings it might be said that majority of people have awareness about taking gastric reducing medication with the pain relieving treatment and very few people don't know that gastric reducing agent should be taken with pain relieving treatment.

4.10 Usual activities of people when they suffer from minor disease like fever , diarrhea or headache

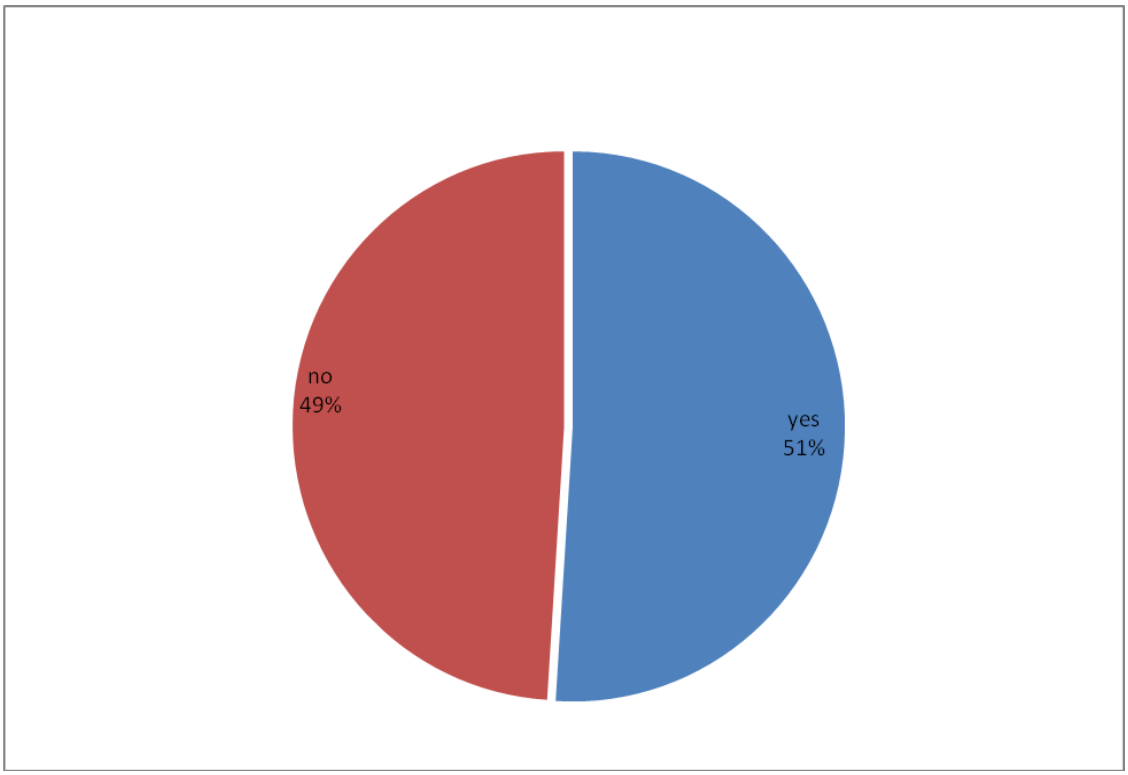
Answer	No. of people	% of people
Visit doctor	8	8%
Taking medicine by their own	89	89%
Others	3	3%



From the findings it might be said that majority of people take medicine by their own when they suffer from minor disease and very few people visit doctor in case of minor disease.

4.11 Percentage of people who read the leaflet given with the medicine

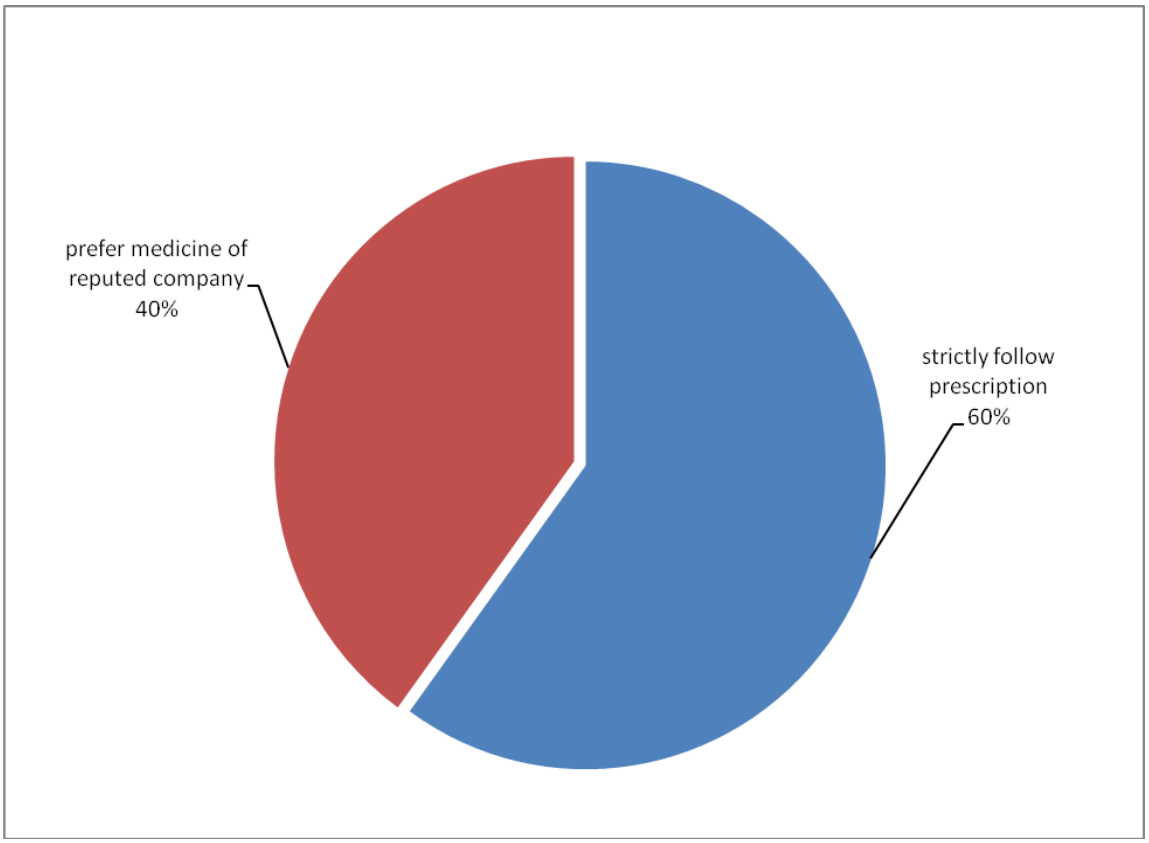
Answer	No. of people	% of people
Yes	51	51%
No	49	49%



From the findings it might be said that most of the people read the leaflet given with medication but there are also a large number of people who don't read the leaflet given with medication.

4.12 Patients' preference in case of brand selection

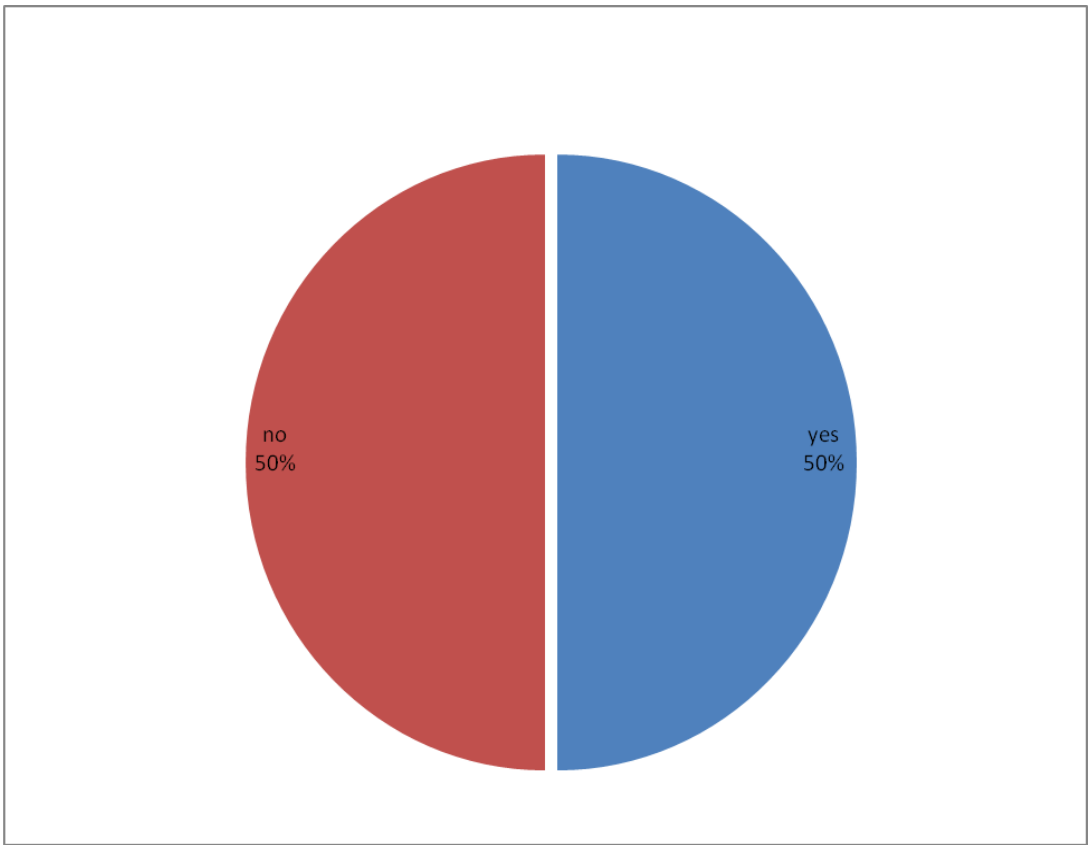
Answer	No. of people	% of people
Prefer medicine of reputed company	40	40%
Strictly follow prescription	60	60%



From the findings it might be said that majority of people strictly follow prescription where few people prefer medicine of reputed company.

4.13 Percentage of people knows about drug-drug interaction

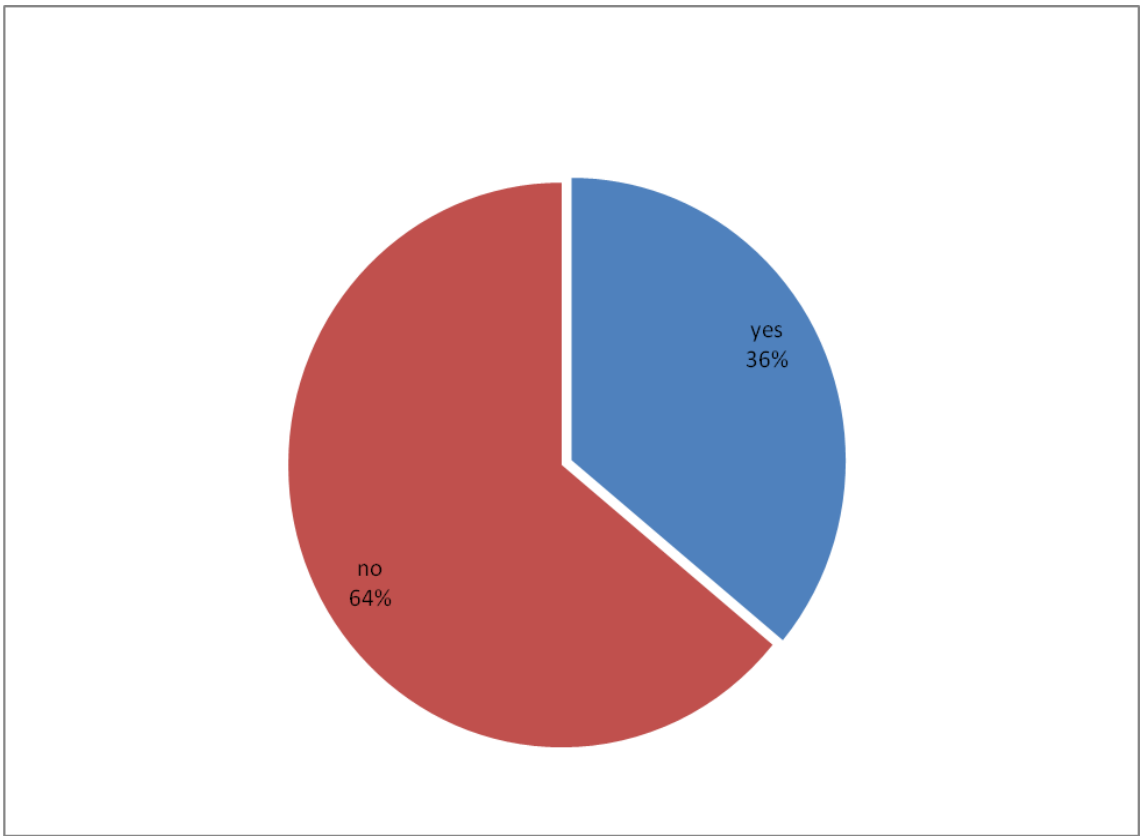
Answer	No. of people	% of people
Yes	50	50%
No	50	50%



From the findings it might be said that half of the people know about drug interaction where other half don't know about it.

4.14 Percentage of people search for information about the drug's side effect before taking the drug

Answer	No. of people	% of people
Yes	36	36%
No	64	64%



From the findings it might be said that majority of people don't search for information about the drug's side effect where few people search for information about drug before taking the drug.

Chapter Five

Conclusion

Conclusion

Rational use of medicines 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 at the lowest cost to them and their community".

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, underuse 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.

The current study was designed to find about the awareness of normal educated people about the rational use of medicines. Outcomes suggest that although most of the people use medication rationally few of them don’t bother to follow the rules. As a consequence their health might face minor to major health risk in the long run.

The present study although performed on a limited scale, yet on the basis of professional judgment, the data reported in this project paper can to get an idea about the awareness of people about rational use of heavily used medicine in Bangladesh. However to get actual and specific outcomes a more detailed & elaborate study should be performed.

Chapter Six

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