

**A RATIONAL USE OF ANTIBIOTICS AT THE  
PRIMARY HEALTH CARE LEVEL OF  
BANGLADESH:**

**A SURVEY REPORT OF SHARIATPUR SHODOR UPOZILLA  
UNDER SHARIATPUR DISTRICT**

A PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF PHARMACY,  
EAST WEST UNIVERSITY BANGLADESH IN PARTIAL FULLFILLMENT OF  
THE REQUIRMENTS FOR THE DEGREE OF BACHELOR OF PHARMACY  
(HONS.)

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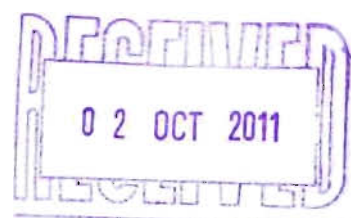
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DEPARTMENT OF PHARMACY

APRIL, 2011



**DEPARTMENT OF PHARMACY  
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## ***CERTIFICATE***

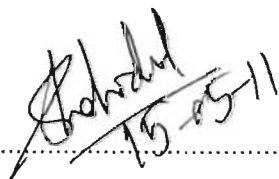
I do hereby declare that the project report entitled, “RATIONAL USE OF ANTIBIOTICS AT THE PRIMARY HEALTH CARE LEVEL OF BANGLADESH: A SURVEY REPORT OF SHARIATPUR SHODOR UPAZILLA UNDER SHARIATPUR DISTRICT”, presented to the Department of Pharmacy, East West University is the outcome of the investigations performed by me under the supervision of Muhammad Shahidul Islam, Lecturer, Department of Pharmacy, East West University. I also declare that no part of this project has been or is being submitted elsewhere for the award of any degree or diploma.

*Sufia Islam*  
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## ***ABSTRACT***

Increasing the rate of antibiotic resistance is a global problem today. One of the most important causes of developing resistance is irrational use of antibiotic. Some other causes are inappropriate prescription of doctors, unjustified self medication of patients. A survey project has been designed at Shariatpur Sadar Upozila under Shariatpur district to measure and explore the abuse of antibiotic. This study is aimed to estimate general knowledge and awareness of patients regarding use of antibiotics to find out possible reasons of irrational use of antibiotics in the rural areas of Bangladesh. It was a questionnaire based cross sectional health survey conducted on 50 subjects aged 15 or over who came to get service at Shariatpur Sadar hospital and in different private clinics. It was found from the study that the general knowledge of the patients about the indication of antibiotics was very poor. Majority of the patients did not know the appropriate use of antibiotics. From physicians survey it was evident that, 27.27% doctors prescribe antibiotic in suspected infection while 63.64% of them prescribed antibiotics in confirmed case, 81.82% reported, patient didn't complete the full course of antibiotic always, 72.73% preferred Cephalosporin incase of empirical therapy. From patient survey we found that, approximately 30% patient visited the doctor for cold, fever, diarrhea, 48% took antibiotic without consulting doctors, 68% stopped taking antibiotic when symptoms disappear, 30% followed the proper time schedule.

This study indicates that there is an urgent need of health education for the community to increase knowledge and awareness about use of antibiotics to decrease the self-medication and inappropriate use of antibiotics.

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***INTRODUCTION***

***CHAPTER ONE:***



# *INTRODUCTION*

## **1.1. Introduction**

In developing countries, acquired bacterial resistance to antimicrobial agents is common in isolates from healthy persons and from persons with community-acquired infections. Complex socioeconomic and behavioral factors associated with antibiotic resistance, particularly regarding diarrheal and respiratory pathogens, in developing tropical countries, include misuse of antibiotics by health professionals, unskilled practitioners, and laypersons; poor drug quality; unhygienic conditions accounting for spread of resistant bacteria; and inadequate surveillance.

Bangladesh has made significant progress in recent times in many of its social development indicators particularly in health. This country has made important gains in providing primary health care since the Alma Ata Declaration in 1978. All health indicators show steady gains and the health status of the population has improved. Infant, maternal and expectancy at birth. It has achieved a credible record of sustaining 90% plus a vaccine coverage in routine EPI along with NIDs (national immunization days) since 1995. But some of this progress is uneven and there exists inequalities between different groups and geographical regions. A major constraint identified towards reaching the MDGs and other national health goals is the issue of shortage in the health workforce and the uneven skill mix<sup>1</sup>.

People are living longer; the average life expectancy at birth in Bangladesh had increased to over 65.1 years in 2004. The maternal death ratio is still high at over 300 per 100,000 live births<sup>2</sup>.

Like most transitional societies, a wide range of therapeutic choice are available in Bangladesh, ranging from self care to traditional and western medicine. The public sector is largely used for in-patient and preventive care while the private sector is used mainly for outpatient curative care. Primary Health Care (PHC) has been chosen by the Government of Bangladesh as the strategy to achieve the goals of “health for all” which is now being implemented as Revitalized Primary Health Care<sup>3</sup>.

## 1.2 General health matters in Bangladesh

Bangladesh is a developing country with more than 75% of the total population (145 millions) living in rural areas containing 82% of the total poor people. About 36% of the population continues to live below the national poverty line. Basic needs of living particularly health and education remain largely unmet and only less than 40% of the total population has access to basic healthcare.

Distribution of health workers (per 1000 population) in Bangladesh is physicians 0.26, nurses 0.14 and pharmacist 0.06.

## 1.3. Country Health Profile - Bangladesh

Country Reported Data for Basic Health and Health-related Indicators<sup>4</sup>.

Indicators	Latest Available Data	Year	Source	Remarks
<b>Population and vital statistics</b>				
Total population (in millions)	129.6	2000	1	Estimates
Population density (persons per sq km)	878 <sup>a</sup>	2000	1	Computed value
Sex ratio (males per 100 females)	105	1996	2	
Population under 15 years (%)	40.0	1996	2	
Population 60 years and above (%)	5.9	1996	2	

Crude birth rate (per 1000 population)	19.9	1998	1	SRS <sup>b</sup>
Crude death rate (per 1000 population)	4.8	1998	1	SRS <sup>b</sup>
Annual population growth rate (%)	1.51	1998	1	Natural growth
Total fertility rate (per woman)	3.3	1997-1999	4	DHS 1999-2000
Urban population (%)	20.1	1991	1	Census results
<b>Socioeconomic Situation</b>				
Gross domestic product per capita (US\$)	373	2000	3	Provisional
Adult literacy rate (%):				
Male	71.9	1999-00	4	For population 6 years and above
Female	62.2	1999-00	4	
Median number of years of schooling:				
Male	2.6	1999-00	4	For population 6 years and above
Female	1.2	1999-00	4	
Prevalence of low birth weight (weight <2500 grams at birth) (%)	19.5	1999-00	4	Mother's estimate of baby's size
Prevalence of underweight (weight-for-age) in children <5 years of age (%)	47.7	1994-99	4	<- 2SD from NCHS median
Prevalence of stunting (height-for-age) in children <5 years of age (%)	44.7	1994-99	4	<- 2SD from NCHS median
<b>Facilities</b>				
Number of hospital beds	43,293	1999	2	Public and private

Population per hospital bed	3,063	1999	2	
Hospital beds per 10,000 population	3.34 <sup>c</sup>	1999	2	Computed value
Number of thana health complexes	460	1999	2	
Number of Union Sub-Centres (USC)	1,362	1999	2	
Number of Community Clinics (CC)	3,315	2001	2	
<b>Human resources</b>				
Number of registered physicians	29,746	2000	2	
Population per physician	4,521	2000	2	
Physicians per 10,000 population	2.29 <sup>c</sup>	2000	2	Computed value
Number of registered nurses	16,972	1999	2	
Number of registered midwives	14,915	1997	2	
Physician to Nurse ratio	2 to1	1997	2	
<b>Budgetary resources</b>				
Total Expenditure on Health (THE) as % of Gross Domestic Product (GDP)	3.8 %	1998	5	
Public Expenditure on Health (PHE) as % of Total Expenditure on Health (THE)	36.5 %	1998	5	
Private Expenditure on Health (PvtHE) as % of Total Expenditure on Health	63.5 %	1998	5	
Public Expenditure on Health (PHE) as % of General Government Expenditure (GGE)	6.9 %	1998	5	
Social Security Expenditure on Health (SSHE) as % of Public Expenditure on Health (PHE)	0.0	1998	5	

Tax funded Health Expenditure (TaxFHE) as % of Public Expenditure on Health (PHE)	89.0	1998	5	
External Resources for Health (Ext Res HE) as % of Public Expenditure on Health (PHE)	11.0%	1998	5	
Private Insurance for Health Risks (Pvt ins HE) as % of Private Expenditure on Health (PvtHE)	0.0	1998	5	
Out-of-Pocket Spending on Health (OOPS) as % of Private Expenditure on Health (PvtHE)	93.9 %	1998	5	
Per capita Total Expenditure on Health (THE) at official Exchange rate (X-Rate per US\$)	12	1998	5	
Per capita Public Expenditure on Health (PHE) at official Exchange rate (X-Rate per US\$)	4	1998	5	
Per capita Total Expenditure on Health (THE) in international dollars (int'l \$)	42	1998	5	
Per capita Public Expenditure on Health (PHE) in international dollars (int'l \$)	16	1998	5	
Health services				
Pregnant women attended by trained personnel during pregnancy (%)	33.7%	1994-99	4	
Deliveries attended by trained personnel (%)	21.8%	1994-99	4	7.1% by doctors, 5.0% by nurse/midwives, 9.7% by trained TBA
Women of childbearing age using family planning (%)	53.8	1999-00	4	Married women 43.4% modern methods
Eligible population (i.e. infants reaching their first birthday) that has been fully immunized according to national immunization policies	52.8	1999-00	4	
Infants reaching their first birthday that have been fully immunized against diphtheria, tetanus, and whooping cough (%)	70.2	1999-00	4	

Infants reaching their first birthday that have been fully immunized against poliomyelitis (%)	69.1	1999-00	4	
Infants reaching their first birthday that have been fully immunized against measles (%)	62.1	1999-00	4	
Infants reaching their first birthday that have been fully immunized against tuberculosis (%)	90.0	1999-00	4	
Women that have been immunized with tetanus toxoid (TT) during pregnancy (%)	63.7	1994-99		TT2+
<b>Health Status</b>				
Life expectancy at birth (years):				
Total	60.8	1998	1	SRS <sup>b</sup>
Male	60.7	1998	1	SRS <sup>b</sup>
Female	60.5	1998	1	SRS <sup>b</sup>
Infant mortality rate (per 1000 live births)	57.0	1998	2	
Under-five mortality rate (per 1000 live births)	82.35	1998	2	
Maternal mortality ratio (per 1000 live births)	3.0	1998	2	

<sup>a</sup> Based on total surface area of 147,570 square kilometers, <sup>b</sup> Sample Registration System

<sup>c</sup> Based on population estimates of 129.6 millions



## 1.4. Health Care Facilities

The Ministry of Health and Family Planning was responsible for developing, coordinating, and implementing the national health and mother-and-child health care programs. Population control also was within the purview of the ministry. The government's policy objectives in the health care sector were to provide a minimum level of health care services for all, primarily through the construction of health facilities in rural areas and the training of health care workers. The strategy of universal health care by the year 2000 had become accepted, and government efforts toward infrastructure development included the widespread construction of rural hospitals, dispensaries, and clinics for outpatient care. Program implementation, however, was limited by severe financial constraints, insufficient program management and supervision, personnel shortages, inadequate staff performance, and insufficient numbers of buildings, equipment, and supplies.

In the late 1980s, government health care facilities in rural areas consisted of sub district health centers, union-level health and family welfare centers, and rural dispensaries. A sub district health center in the mid-1980s typically had a thirty-one-bed hospital, an outpatient service, and a home-service unit staffed with field workers. Some of the services, however, were largely nonoperative because of staffing problems and a lack of support services. Health services in urban areas also were inadequate, and their coverage seemed to be deteriorating. In many urban areas, nongovernment organizations provide the bulk of urban health care services. Programming and priorities of the nongovernment organizations were at best loosely coordinated.

A union-level health and family welfare center provided the first contact between the people and the health care system and was the nucleus of primary health care delivery. As of 1985 there were 341 functional sub district health centers, 1,275 rural dispensaries (to

be converted to union-level health and family welfare centers), and 1,054 union-level health and family welfare centers. The total number of hospital beds at the sub district level and below was 8,100.

District hospitals and some infectious-disease and specialized hospitals constituted the second level of referral for health care. In the mid-1980s, there were 14 general hospitals (with capacities ranging from 100 to 150 beds), 43 general district hospitals (50 beds each), 12 tuberculosis hospitals (20 to 120 beds each), and 1 mental hospital (400 beds). Besides these, there were thirty-eight urban outpatient clinics, forty-four tuberculosis clinics, and twenty-three school health clinics. Ten medical college hospitals and eight postgraduate specialized institutes with attached hospitals constituted the third level of health care.

In the mid-1980s, of the country's 21,637 hospital beds, about 85 percent belonged to the government health services. There was only about one hospital bed for every 3,600 people. In spite of government plans, the gap between rural and urban areas in the availability of medical facilities and personnel remained wide. During the monsoon season and other recurrent natural disasters, the already meager services for the rural population were severely disrupted<sup>5</sup>.

## **1.5. Primary Health Care in Bangladesh**

### **1.5.1. Primary Health Care**

Primary health care (PHC) incorporates personal care with health promotion, the prevention and community development. The philosophy of PHC includes the interconnecting principles of equity, access, empowerment, community self – determination and intersectional collaboration. It encompasses an understanding of the social, economic ,cultural and political determinants of health (Kelcher H. 2001).

A definition of PHC developed in Australia to suit the needs of this country is: Primary Health Care seeks to extend the first level of the health system from sick care to the development of health. It seeks to protect and promote the health of defined communities and to address individual and population health problems at an early stage. Primary health care service involve continuity of care, health promotion and education, integration of prevention with sick care, a concern for population as well as individual health, community involvement and the use of appropriate technology (Fry D, Furler J, 2000).

### **1.5.2. The Goal of Primary Health Care**

The ultimate goal of primary health care is better health for all. WHO has identified five key elements to achieving that goal:

- Reducing exclusion and social disparities in health (universal coverage reforms);
- Organizing health service around people’s needs and expectations (service delivery reforms);
- Integrating health into all sectors (public policy reforms);

- Pursuing collaborative models of policy dialogue (leadership reforms); and
- Increasing stakeholders participation<sup>6</sup>.

### **1.5.3. Four Essential Components Of Primary Health Care**

Universals coverage by ensuring sufficient supply of medicines and services, removing financial barriers and ensuring social health protection

People- centered care by transforming traditional healthcare delivery models (specialist, procedure of hospital-based) into people-centered primary care networks

Inclusive leadership by shifting from conventional “command-and-control” approach, increasing participation of all stakeholders and moving from supply-led to demand-led policies and programs

Health in all policies by ensuring that all relevant sectors (e.g. labor, environment, education) factor health into their agendas.

## **1.6 Health System in Bangladesh**

Bangladesh has made significant progress in recent times in many of its social development indicators particularly in health. This country has made important gains in providing primary health care since the Alma Ata Declaration in 1978. All health indicators show steady gains and the health status of the population has improved. Infant, maternal and under-five mortality rates have all decreased over the last decades, with a marked increase in life expectancy at birth. It has achieved a credible record of sustaining 90% plus vaccine coverage in routine EPI along with NIDs (national immunizations days) since 1995. But some of this progress is uneven and there still exists inequalities

between different groups and geographical regions. A major constraint identified towards reaching the MDGs and other national health goals is the issue of shortages in the health workforce and the uneven skill mix.

Like most transitional societies, a wide range of therapeutic choices are available in Bangladesh, ranging from self care to traditional and western medicine. The public sector is largely used for in-patient and preventive care while the private sector is used mainly for outpatient curative care. Primary Health Care (PHC) has been chosen by the Government of Bangladesh as the strategy to achieve the goals of “Health for all” which is now being implemented as Revitalized Primary Health Care.

### **1.6.1 The Public Sector**

The primary care in the public sector is organized around the Upazila Health Complex (UHC) at sub-district level which works as a health-care hub. These Units have both in- and out-patient services and care facilities. Most commonly, they have in-patient care support with 31 beds, while some UHC have over 50 beds. Many UHC Units have a package service called “comprehensive emergency obstetric care services” (EOC) available, with an expert gynaecologist, an anaesthetist and skilled support nurses on duty round-the-clock, and basic laboratory facilities. At a lower tier, the Union Health and Family Welfare Centre (UHFWC) are operational, constituted with two or three sub centers at the lowest administrative level, and a network of field-based functionaries. The public sector field-level personnel are comprised of Health Assistants (HAs) in each union who supposedly make home visits every two months for preventive healthcare services, and Family Welfare Assistants (FWAs) who supply condoms and contraceptives pills during home visits. Recently some of the female HAs and FWAs have been trained as birth attendants (skilled birth attendants – SBAs), to provide skilled services within a household setting. The number of health assistants is determined according to the size of the population. The Health Assistants and Family Welfare Assistants are supervised by a Health Inspector (HI) and a Family Planning Inspector

(FPI) respectively, posted at the union level. The UHC is staffed by ten qualified allopathic practitioners and supporting staff, while the UHFWCs are staffed by professionals such as a Medical Assistant (MA/SACMO) and mid-wife (Family Welfare Visitor), both trained in formal institutions. The Union Health and Family Welfare Centers (UHFWCs) provide out-patient care only.

Above the sub district are the district hospitals (100-250 beds) and medical colleges (serving a group of districts with around 650 beds) providing secondary care, and national tertiary level care facilities. A common tendency is observed in terms of utilization – a stark imbalance in service utilization at public health facilities. There is low utilization of most facilities at the primary level (Upazila and below) and overutilization of facilities at the secondary and tertiary levels.

### **1.6.2. The Private Sector**

In the private sector, there are traditional healers (Kabiraj, totka, and faith healers like pir / fakirs), homeopathic practitioners, village doctors (rural medical practitioners RMPs/ Palli Chikitsoks-PCs), community health workers (CHWs) and finally, retail drugstores that sell allopathic medicine on demand. In addition to dispensing medicine, sellers at these mostly unlicensed and unregulated retail outlets also diagnose and treat illnesses despite having no formal professional training. All of these informal providers are deeply embedded in the local community and culture and are easily accessible, providing inexpensive services to the villagers with occasional deferred payment, and payment in kind being accepted instead of cash. To this is added an emerging cadre of

semi-qualified community health workers / volunteers, who are formally trained by the NGOs (such as BRAC, Gonoshasthya Kendra etc); their numbers have been increasing since the 1990's with the expansion of PHC infrastructure in the country.

### **1.6.3. Traditional Medicine**

Grouped under "traditional medicine" are most of the medical practices that fall outside the realm of 'scientific' medicine. Thus, Kabiraj, totka, herbalists, practitioners of 'Folk Medicine' and faith healers (e.g. pir, fakir etc.) of different shades fall under this broad umbrella. Many of these healers (e.g. faith healers) provide a much narrower range of services for a more limited set of conditions<sup>7</sup>.

## **1.7. Antibiotic**

Antibiotics are among the most frequently prescribed medications in modern medicine. Antibiotics cure disease by killing or injuring bacteria. The first antibiotic was penicillin, discovered accidentally from a mold culture. Today, over 100 different antibiotics are available to doctors to cure minor discomforts as well as life-threatening infections.

Although antibiotics are useful in a wide variety of infections, it is important to realize that antibiotics only treat bacterial infections. Antibiotics are useless against viral infections (for example, the common cold) and fungal infections (such as ringworm). Your doctor can best determine if an antibiotic is right for your condition.

### **1.7.1. What are antibiotics for?**

An antibiotic is given for the treatment of an infection caused by bacteria. Antibiotics target microorganisms such as bacteria, fungi and parasites. However, they are not

effective against viruses because viruses are not microorganisms. If you have an infection it is important to know whether it is caused by bacteria or a virus. Most upper respiratory tract infections, such as the common cold and sore throats are generally caused by viruses - antibiotics do not work against these viruses.

If antibiotics are overused or used incorrectly there is a chance that the bacteria will become resistant - the antibiotic becomes less effective against that type of bacterium.

A broad-spectrum antibiotic can be used to treat a wide range of infections. A narrow-spectrum antibiotic is only effective against a few types of bacteria. There are antibiotics that attack aerobic bacteria, while others work against anaerobic bacteria. Aerobic bacteria need oxygen, while anaerobic bacteria don't.

### **1.7.2. Types of Antibiotics**

There are many different kinds of antibiotics. The type of antibiotics you take depends on the type of infection you have and what kind of antibiotics are known to be effective.

#### **The main classes of antibiotics:**

- Aminoglycosides
- Cephalosporins
- Fluoroquinolones
- Macrolides
- Penicillin
- Tetracycline



### **1.7.2.1. Macrolide**

There are a couple of new relatives of erythromycin (azithromycin and clarithromycin) that work the same way, but kill more bugs and have slightly fewer side effects. The erythromycin-like antibiotics are also known as macrolides. Macrolides belong to the polyketide class of natural products. Macrolide antibiotics are used to treat respiratory tract infections, genital, gastrointestinal tract, soft tissue infections caused by susceptible strains of specific bacteria.

Macrolides bind with ribosomes from susceptible bacteria to prevent protein production. This action is mainly bacteriostatic, but can also be bactericidal in high concentrations.

Macrolides cause very little allergy problems compared to the penicillins and cephalosporins, the biggest concern with these medicines is that they can irritate the stomach.

#### **The most commonly-prescribed macrolides:**

- erythromycin
- clarithromycin
- azithromycin
- roxithromycin

### **1.7.2.2. Cephalosporins**

Cephalosporins are grouped into "generations" by their antimicrobial properties. Cephalosporins are categorized chronically, and are therefore divided into first, second, and third generations. Currently, three generations of cephalosporins are recognized and a fourth has been proposed. Each newer generation of cephalosporins has greater gram negative antimicrobial properties than the preceding generation. The later-generation

#### ◆ Fourth generation

- cefepime
- ceftazidime

### **1.7.2.3. Fluoroquinolones**

Fluoroquinolones are known as broad-spectrum antibiotics, meaning they are effective against many bacteria. Fluoroquinolones are used to treat most common urinary tract infections, skin infections, and respiratory infections (such as sinusitis, pneumonia, bronchitis). Common side effects of fluoroquinolones include mainly the digestive system: mild stomach pain or upset, nausea, vomiting, and diarrhea. These are usually mild and go away over time. Fluoroquinolones should not be given during pregnancy.

Fluoroquinolones inhibit bacteria by interfering with their ability to make DNA. This activity makes it difficult for bacteria to multiply. This effect is bacteriocidal.

The most commonly-prescribed fluoroquinolones:

- ciprofloxacin
- gatifloxacin
- gemifloxacin
- levofloxacin
- moxifloxacin
- norfloxacin
- ofloxacin
- trovafloxacin

#### **1.7.2.4. Penicillins**

Penicillin was the first antibiotic discovered by Alexander Fleming in 1929. Penicillins are used to treat skin infections, dental infections, ear infections, respiratory tract infections, urinary tract infections, gonorrhea. Penicillins are sometimes combined with other ingredients called beta-lactamase inhibitors, which protect the penicillin from bacterial enzymes that may destroy it before it can do its work.

Penicillins are usually very safe. The greatest risk is an allergic reaction, which can be severe. People who have been allergic to cephalosporins are likely to be allergic to penicillins.

Penicillins block the construction of bacteria cell walls, causing the walls to break down, and eventually killing the bacteria.

#### **The most commonly-prescribed penicillins:**

- amoxicillin
- ampicillin
- bacampicillin
- oxacillin
- penicillin<sup>8</sup>.

#### **1.7.3. Use of Antibiotics In Bangladesh:**

##### **1.7.3.1. Study says 50 percent antibiotics being prescribed needlessly in Bangladesh**

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Dhaka, Bangladesh (BBN)- Over 50 per cent antibiotics are being prescribed in Bangladesh needlessly that extend time period of treatment and cause dissatisfaction of patients to medicine.

The study also warned that in near future the treatment of viral diseases will be more complicated if the germs are not discovered. The study findings were disclosed on Tuesday(22December 2010) at a scientific conference at the Centre of Excellence of Dhaka University (DU) in the capital. Department of Clinical Pharmacy and Pharmacology of DU and School of Pharmacy of the University of Nottingham, England, jointly conducted the study in cooperation with British Council in Bangladesh. The study included six district hospitals of the country in its survey --Brahmanbaria, Feni, Khulna, Mymensingh, Narail and Sherpur. Findings shown that doctors in the hospitals mentioned have been prescribing antibiotics for their 90 percent patients in the general medicine, surgery and paediatric units.

Pran Gopal Datta, Vice chancellor, Bangabandhu Sheikh Mujib Medical University (BSMMU), said medical profession has become a profitable business as the number of patients is rapidly increasing and a few skilled physicians are competing with each other. He termed the findings alarming for the country's health sector.

### **1.7.3.2. Use Of Antibiotics By Village Doctors Puts Rural Health At High Risk**

DHAKA, Sept 17 (BSS) - An ICDDRB study has found that a sizable section of the unqualified allopathic village doctors have been prescribing antibiotics at will for quick recovery of patients from infections, putting rural health at high risk of bacterial resistance.

The study being run for over last three years in rural areas says the village doctors, who occupy 95 percent of rural healthcare, are treating the common cold and fever as well as

pneumonia and diarrhoea with inappropriate and harmful drugs that also include antibiotics and steroids. Study findings suggest that there is a significant gap in adherence to appropriate treatment in compliance with the standard treatment guidelines of World Health Organization (WHO) and the government.

Antibiotics are used for treating infections caused by bacteria as antibiotics aren't effective against viruses that cause illnesses such as common cold and flu. The very first antibiotic discovered was penicillin, and it's still widely used to treat many common bacterial infections. If someone doesn't take antibiotics according to the instructions, this can lead to bacteria becoming resistant to them and these bacteria can then become difficult to treat. Stopping antibiotics at early stage of treatment may also increase the risk of antibiotic resistance and such resistance can lead to further, and possibly more serious, infections, physicians say.

So it is important to take antibiotics only when it's really necessary and prescribed only by the qualified doctors. The antibiotics must not be stopped at early or mid stage of treatment, even if the symptoms of disease improve. Antibiotics usually come as tablets, capsules or syrup for children. They can also be given by injection, or applied to the affected part of your body such as the skin, eyes or ears as drops, lotions or ointments.

"Antibiotics are seen to be recommended by village doctors even for common cold and fever that do not require such medicines," Dr Mohammad Iqbal, one of key investigators of the study, tells BSS, adding ignorance and money making motives have been influencing a section of quacks to continue such unauthorized practices in rural areas. Citing an example of antibiotics abuse, Dr. Iqbal says during the study they have found that 88 percent of antibiotics in rural Cox's Bazar were recommended by village doctors as opposed to only 5.3 percent by the MBBS doctors. He, however, says a minor intervention among quacks at the mid-level of the 42-month study has proved effective as it brought down antibiotic malpractice substantially among local healers.

But Iqbal wanders about continuation of such practices in other parts of the country, where neither any baseline nor any intervention was made so far to reduce the harms caused by the village doctors. He suggested that these quacks should be brought under strong regulatory mechanism to deter recurrence of such practices. Asked about what adverse impacts have already faced by the people in Chakaria study areas, the physician cum researcher says, they have been looking for partners to conduct a separate study to assess the health consequences due to abuses of antibiotics. He, however, cited an example of abuses of high quality antibiotics-ciprofloxacin and cotrim- which were very popular but later become resistant because of malpractices in Bangladesh.

According to nationwide survey of 2007, the country has a shortage of 60,000 qualified physicians, 280,000 nurses and 483,000 health technologists. Thousands of village doctors, who include drug sellers, homeopathic doctors as well as traditional and religious healers, are filling the huge gap of service providers in the field of health.

### **1.8. Prevalence of antibiotic resistance in Bangladesh:**

Infections caused by resistant bacteria can strike anyone – the young and the old, the healthy and the chronically ill. Antibiotic resistance also is a serious problem for patients whose immune systems are compromised, such as people with HIV/AIDS and patients in critical care units.

Some study about prevalence of antibiotic resistance in Bangladesh is given below:

#### **In 2009**

M. Rahman, J Haq, M. Hossain, R. Sultana, F. Islam, A. Islam surveyed to find out the prevalence of extended-spectrum  $\beta$ -lactamases (ESBL)-producing organisms in an urban hospital in Dhaka city. They were assessed over a 10-month period. A double disk test was performed to detect ESBL-producing *Escherichia coli* and *Klebsiella pneumoniae*. 43.2% and 39.5% of *E. coli* and *K. pneumoniae* had ESBL phenotypes respectively. The

combination of augmentin with ceftazidime detected the most ESBL-producing *E. coli* (39.5%) while augmentin with cefraxone was the best combination for the detection of ESBL (31.6%) in *K. pneumonia*.

#### **In 2007**

D.V. Kaundinya, A.S. Danie and R.P. Fule studied 468 cases of shigellosis in a rural hospital showed that the children in the age group of 1-10 years were maximally affected. The 28 strains of shigella isolated, belonged to all the four subgroups with preponderance of *Sh. dysenteriae* type 1 (50%), followed by *Sh. flexneri* (42.5%). Only a single strain each of *Sh. Boydii* (3.57%) and of *Sh. Sonnei* (3.57%) were isolated. The sensitivity was highest (100%) with gentamycin, furazolidone and cotrimoxazole followed by neomycin (96.4%) and kanamycin (96.4%). The resistance was highest with tetracycline (89.29%) followed by streptomycin (85.72%), ampicillin (67.86%) and chloramphenicol (64.29%). Multi drug resistance, possibly plasmid-mediated was observed and the four drug resistance pattern (ACST) was prevalent (42.85%).

#### **In 2004**

Shamsun Nahar et al determined, antimicrobial susceptibility of 120 *Helicobacter pylori* isolated to metronidazole, tetracycline, clarithromycin, amoxicillin and 77.5, 15, 10, and 6.6% of the isolates respectively, were resistant. Only *rdxA* inactivation and both *rdxA* and *frxA* inactivation were responsible for metronidazole resistance in 66% (8 of 12) and 33% (4 of 12) of Eradication of *Helicobacter pylori* infected by treatment with two antimicrobial agents (clarithromycin and amoxicillin or metronidazole) and a proton pump inhibitor is recommended by various consensus group.

Antimicrobial resistance in *H. pylori* is a growing problem as it is the most important factor in determining treatment outcome. In Bangladesh, the prevalence of *H. pylori* infection among infants, children, and adults are 61, 84, and 92% respectively.

### **In 1997**

Almas M. Momenah and Atif H. Asghar surveyed to evaluate the antimicrobial susceptibility pattern amongst *H. pylori* clinical strains isolated from the main hospitals in the western region of the country. Antimicrobial susceptibility testing was performed for 137 clinical isolates of *H. pylori* recovered from 368 patients undergoing endoscopy examination. The antibiotics used were amoxicillin, tetracycline, clarithromycin, and metronidazole. A high percentage of resistance was observed against metronidazole (48.2%) followed by clarithromycin (27.7%), amoxicillin (14.6%) and tetracycline (9.5%). A total of 12 (8.8%) multidrug-resistant *H. pylori* isolates were observed in this study. Moreover, a warning sign of emerging resistance to amoxicillin, tetracycline and clarithromycin was noted.

### **In 1992**

Mishra, S (S) et al, surveyed to evaluate the current outbreak of multidrug resistance typhoid fever. Forty six blood culture positive cases were studied during the current outbreak of multidrug resistant typhoid fever (MRTF). The present outbreak was caused by El phase type and organisms were resistant to all commonly used drugs for the treatment of typhoid fever. Viz, chloramphenicol (78%), co-trimoxazole (76%) and ampicillin (68%). Treatment failures with chloramphenicol (45.5%) corroborated well with in vitro resistance. No treatment failure was seen with chloramphenicol and ceftriaxone, when these drugs were used in cases infected with sensitive strains. Among the alternative drugs used in cases with in vitro sensitivity, successful clinical response was seen with ceftriaxone (4/4) and cefotaxime (8/9) as compared to cephalexin (3/5) or a combination of cephalexin and furazolidone (9/12).

*Shigella sonnei* is a significant cause of diarrhoea. From 1999 to 2003, 445 strains of *S. sonnei* were isolated from patients admitted to ICDDR, B's Dhaka hospital, random subset of 184 strains were analyzed. More than 60% of the isolates were resistant to nalidixic acid. 89% to trimethoprim-sulphamethoxazole and 9.5% ampicillin, suggesting that trimethoprim-sulphamethoxazole is not an appropriate treatment for shigellosis.



## **1.9. Misuse of antibiotics**

Misuse of antibiotics is a problem in countries across the world, but particularly in the South, where people often use them to treat any minor infection, with or without a doctor's prescription. Inappropriate use of antibiotics frequently leads to the development of resistant strains of the bacteria that cause infection. This means that in future these antibiotics will not be effective in treating infections. Excessive use of antibiotics also increases the cost of treatment unnecessarily.

## **1.10. The value of antibiotics**

Modern medical care often relies on antibiotics. Antibiotics are an effective treatment for curing infection and speeding recovery from illness. They are readily available and relatively free from harmful side-effects.

## **1.11. .Antibiotic misuse by health workers**

With an ever-increasing number of antibiotics becoming available to treat bacterial infections, health workers must be careful to choose the most appropriate drug for each infection. They also need to consider specific health risks, such as an allergy to the antibiotic, and whether the patient is able to follow the complete treatment requirements. Medical expertise is needed to make appropriate decisions about the type of drug, its dose, how frequently it is given and the duration of treatment.

## **1.12. Patient responsibility**

No matter how effective a drug may be, it will not work properly if the patient does not follow the instructions. Often, people will stop taking the antibiotics as soon as they feel better, and not finish the complete course of treatment. This may reduce the effectiveness of the cure and can even cause the infection to worsen. Sometimes people take an overdose, in the false belief that by taking more of the drug they will get better faster. The importance of completing the full course of antibiotics and taking the correct dose at the stated times, must be emphasised by the doctor prescribing the antibiotics and the pharmacist who dispenses them. People should be careful when buying antibiotics. They should buy them from a reliable pharmacist and check that the antibiotics are genuine and are not out of date. Antibiotics should be stored in cool and dry conditions<sup>9</sup>.

## **1.13. Reducing antibiotic misuse**

Doctors and pharmacists who provide antibiotics should ensure that whenever an antibiotic is given, the dose and duration of use are appropriate and understood by the patient. Hospitals should adopt measures that restrict the use of stronger antibiotics, and monitor resistance to antibiotics. Patients should take responsibility not to buy antibiotics without a prescription, and if prescribed, to follow the treatment plan fully and accurately.

## **1.14. How Are Antibiotics Overused Or Misused?**

Some doctors give patients antibiotics when they might not be helpful. For example, a patient with a cold may pressure a doctor into prescribing an antibiotic because the

patient hopes to get a quick fix to his/her illness. Antibiotics won't cure a cold because colds are caused by viruses, not bacteria.

Antibiotics have no effect on viral infections. The treatment for a cold is generally rest, plenty of fluids and medicines for fever and headache.

Antibiotics are misused because many patients do not take them according to their doctor's instructions. They may stop taking their antibiotics too soon, before their illness is completely cured. This allows bacteria to become resistant by not killing them completely.

Some patients save unused medicine and take it later for another illness, or pass it to other ill family members or friends.

These practices may result in the wrong antibiotics being used. They can also lead to the development of resistant bacteria<sup>10</sup>.

### **1.15. Shariatpur Sadar Upazila**

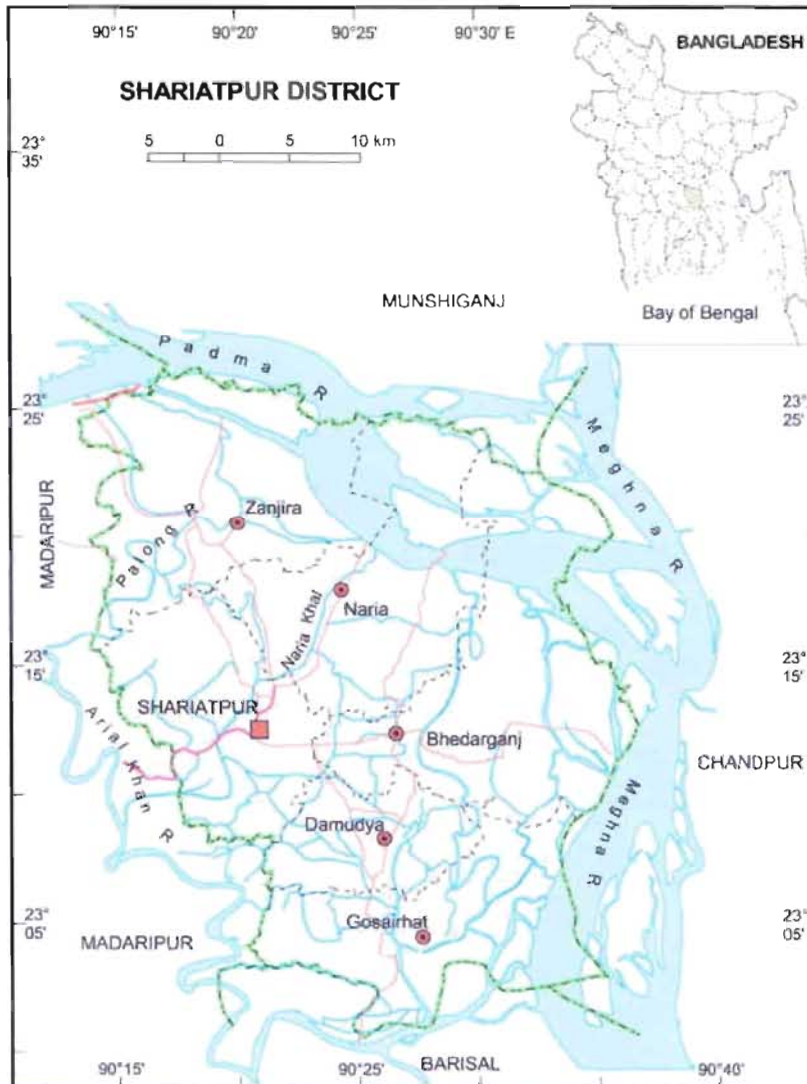
Shariatpur Sadar Upazila (SHARIATPUR district) with an area of 175.08 sq km, is bounded by ZANJIRA upazila on the north, DAMUDYA, BHEDARGANJ and NARIA upazilas on the east, KALKINI upazila on the south, MADARIPUR SADAR upazila on the west. Main river is Kirtinasha.

Shariatpur (Town) consists of 9 wards and 26 mahallas. The area of the town is 25.5 sq km. The Shariatpur Municipality was established in 1990. The town has a population of 42154; male 51.55%, female 48.45%. The density of population is 1653 per sq km.

Administration Shariatpur (former name Palong) thana was turned into an upazila in 1984. It consists of 1 municipality, 10 union parishads, 129 mouzas, 147 villages and 9 wards.

Population 161962; male 50.36% female 49.64%; Muslim 92.20%, Hindu 7.40% and others 0.40%.

Literacy and educational institutions Average literacy 25.3%; male 32.6% and female 17.9%. Educational institutions: government college 1, non-government college 2, Government high school 1, non-Government high school 14, junior high school 7, Government primary school 75 and non-Government primary school 19, NGOs operated school 28, madrasa 9, satellite school 7, community school 28. Noted institution: Palong Multilateral High School (1939).



**Fig 1.1 : Map of Shariatpur Sadar Upozilla**

Literacy and educational institutions Average literacy 25.3%; male 32.6% and female 17.9%. Educational institutions: government college 1, non-government college 2, Government high school 1, non-Government high school 14, junior high school 7, Government primary school 75 and non-Government primary school 19, NGOs operated school 28, madrasa 9, satellite school 7, community school 28. Noted institution: Palong Multilateral High School (1939).

NGO activities SDS, Grameen Unnayan Sangstha, Gono Unnayan Prochesta, BRAC, ASA and Madaripur Legal Aid Association.

1. Health centre Government hospital 1
2. satellite clinic 4,
3. family planning centre 15

### **Shariatpur Sadar Upozila health complex**

Location : In Shariatpur district

No of doctors : 15 (including visiting doctors)

No of nurses : 65

Bed capacity : 600

No of ambulance : 1

No of Operational Theater : 0

No of departments: 3 (medicine, gynecology,eye)

Doctors 1/1000: **1:1000**



Fig: working in Shariatpur health complex

***CHAPTER TWO:***

***METHODOLOGY***

## ***METHODOLOGY***

### **2.1. Study design;**

The survey was conducted at the Shariatpur Sadar hospital, and some private clinic in Shariatpur Sadar Upazila in Shariatpur district under Dhaka division. The survey sample was drawn from the target population (Shariatpur Sadar hospital) and the information was obtained from the sample once by questioning them and collect the information provided by them.

### **2.2. Sample selection:**

The Shariatpur Sadar hospital under Dhaka division was surveyed. I was assigned for that upazila to carryout the survey. Questionnaire sheets for the doctors &for the patients were prepared in order to carry out the survey. From date (28.12.2010-03.01.2011),the survey was carried out. The questionnaire sheet contains 14 questions for doctors and 17 questions for the patient. A total of 11 questionnaires were processed from physicians survey and a total 50 questionnaires sheets from patient survey were considered. Most of the patients were female and age 18-60 years.

### **2.3. Field work:**

I dedicated to conduct personal interview. I am a student of pharmacy at East West University Bangladesh. I have the theoretical as well as practical knowledge of data collection techniques.



## **2.4. Data collection:**

During survey separate questionnaires were prepared for physicians & patient survey (attached to this chapter). Questionnaire for physicians covered their habit of prescribing antibiotic in term of frequency, disease severity, justification of the ground of antibiotic prescription at any given clinical condition and other relevant information. The patient questionnaire covered question relavant to their illness, their capacity of buying antibiotics, their trend to stick to doctor's prescription and other relevant question. The data source is primary. The sample size fifty was selected randomly.

## **2.5. Statistical analysis:**

Simple descriptive statistical analysis of the data was performed using MS excel.

***CHAPTER THREE:***

***RESULT & DISCUSSION***

## ***RESULT AND DISCUSSION:***

### **3.1: Analysis of the data from doctors' survey:**

**QS A: Antibiotics should be prescribed only after conformation of infection.**

<b>Response</b>	<b>No of doctors</b>	<b>% of doctors</b>
Yes	7	63.64%
No	1	9.09%
Not always	3	27.27%

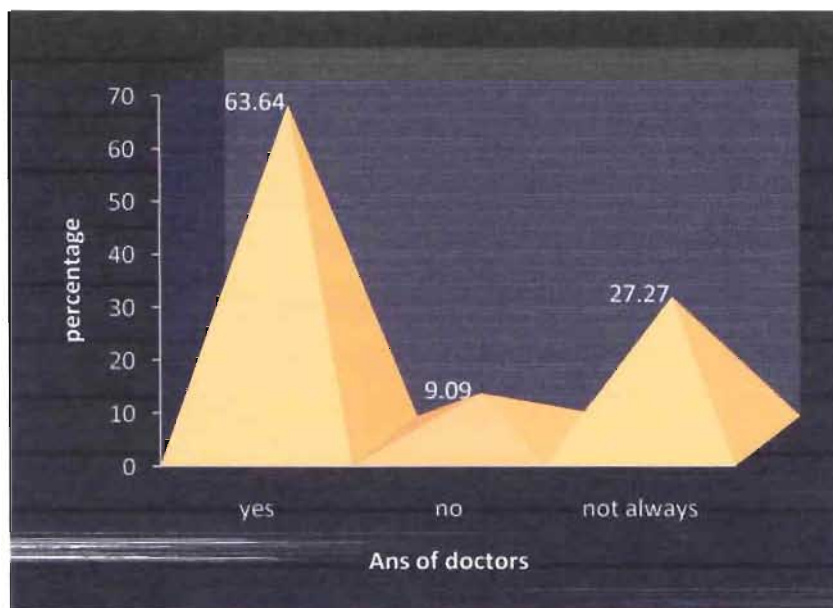
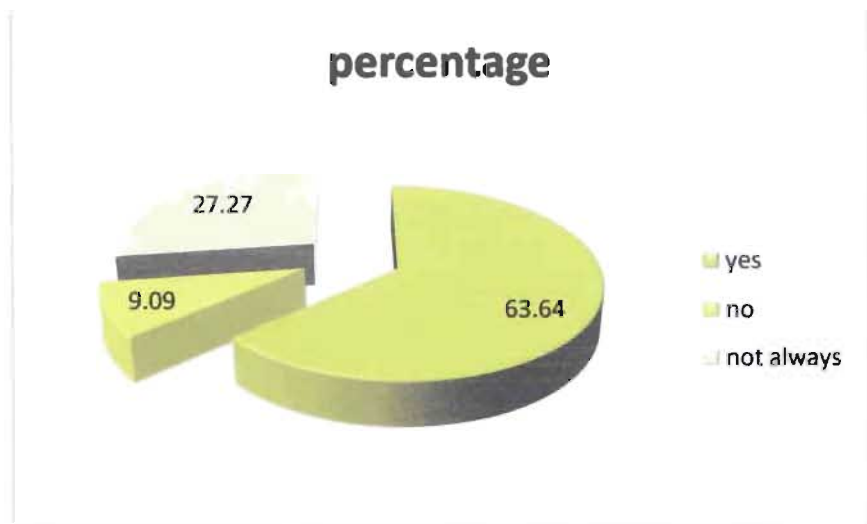


Fig: result in pyramid diagram



**Fig: Result in pie diagram**

After survey I found that 63.64% doctors prescribes antibiotics after confirming the infection, 27.27% doctors said not always, because this test is not available in the rural condition. And 9.09% doctors do not follow the conformation process.

**QS B: How frequently do you use antibiotics after antibiotics susceptibility test?**

Use of antibiotic susceptibility test	No of doctors	% of doctors
Very frequently	2	18.18
Sometimes	5	45.46
Rare	4	36.36

Answer in Column diagram:

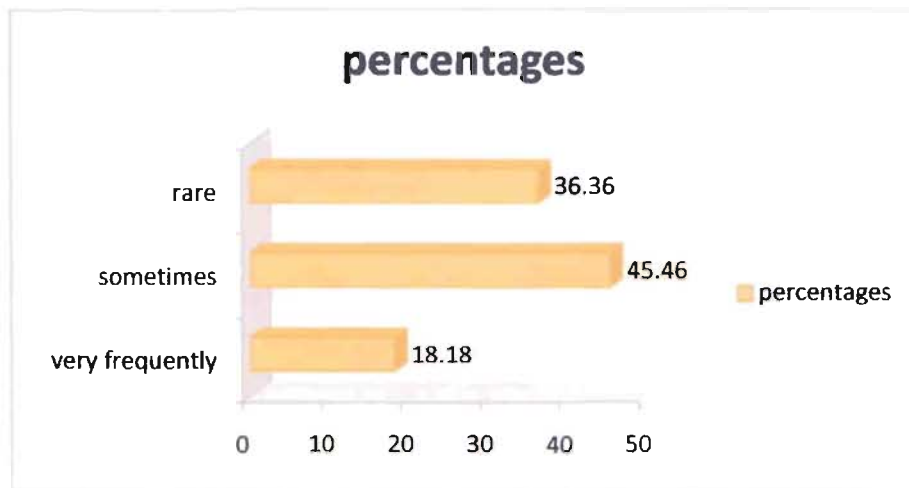


Fig: Results in Bar diagram

For the unavailability of the antibiotic susceptibility test only 18.18% doctor use this very frequently.45.46% uses sometimes and 36.36% uses rarely.

**QS C: In case of empirical antibiotics therapy, which group of antibiotics do you prefer most?**

Group of antibiotics	No of doctors	Percentages
Penicillins	0	0
Cephalosporins	8	72.73
fluroquinolones	1	9.09
macrolides	2	18.18

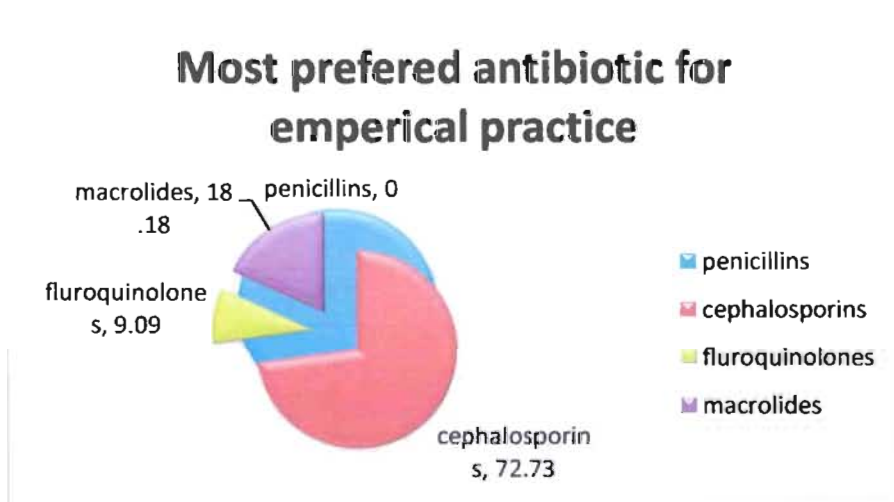


Fig: Result in pie chart

.According to the report penicillins are not used now a days. Cephalosporins are used frequently (72.73%).Macrolides are used by 18.18% doctors. Fluroquinolone is also used. (9.09%)

**QS.D : Do u use more than one antibiotics at a time during empirical practice?**

Response	No of doctors	Percentages
Yes	0	0
No	3	27.27
Not always	8	72.73

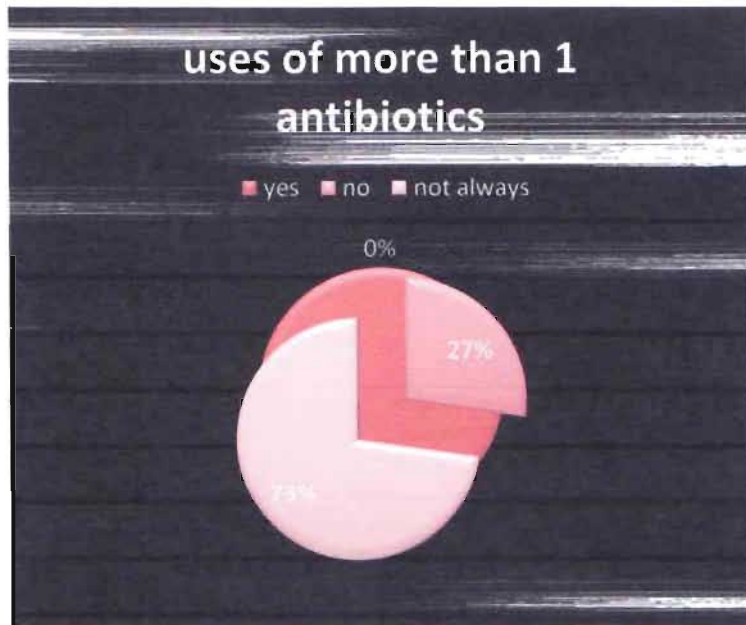
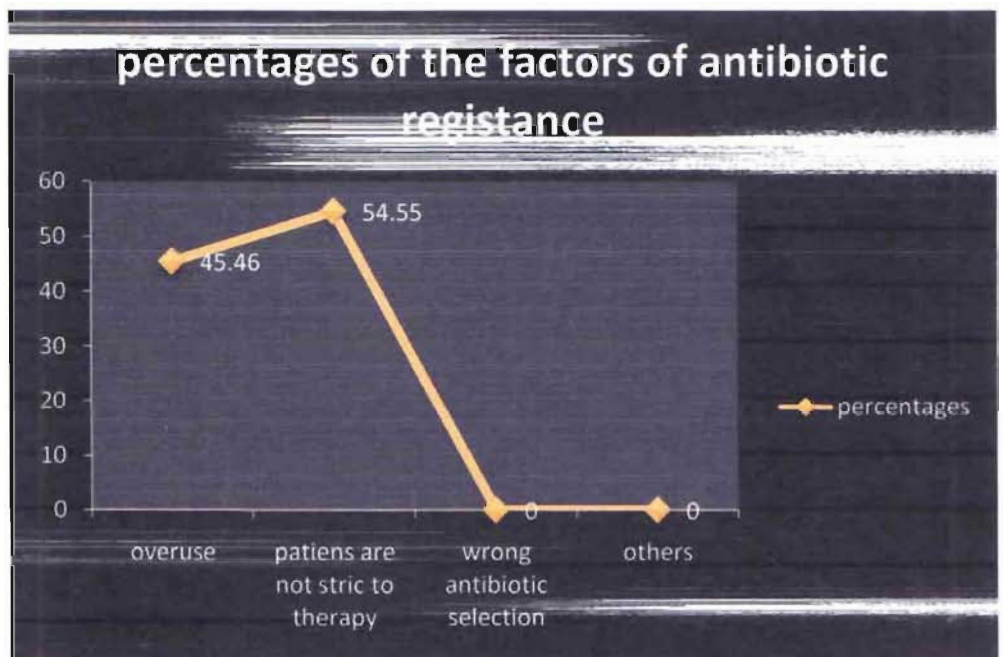


Fig: Result in pie chart

The report shows that doctors not always prescribe more than antibiotics for empirical practice (72.73%). Only a few percentage not use this (27.27%).

**QS E. What are the factors that play most significant role in antibiotic resistance?**

Factors for resistance	No of doctors	Percentages
Overuse	5	45.46
Patients are not stick to the therapy	6	54.55
Wrong selection of antibiotics	0	0
Others	0	0



**Fig: result in Line chart**

Patients are not stick to the therapy which causes resistance mostly (54.55%). Moreover overdose is also a vital cause (45.46%) on the basis of the survey.



**QS F. How frequently do you observe that a prescribed antibiotic is not working?**

Observation	No of doctors	Percentages
Very frequently	2	18.18
Rarely	1	9.09
Sometimes	8	72.73

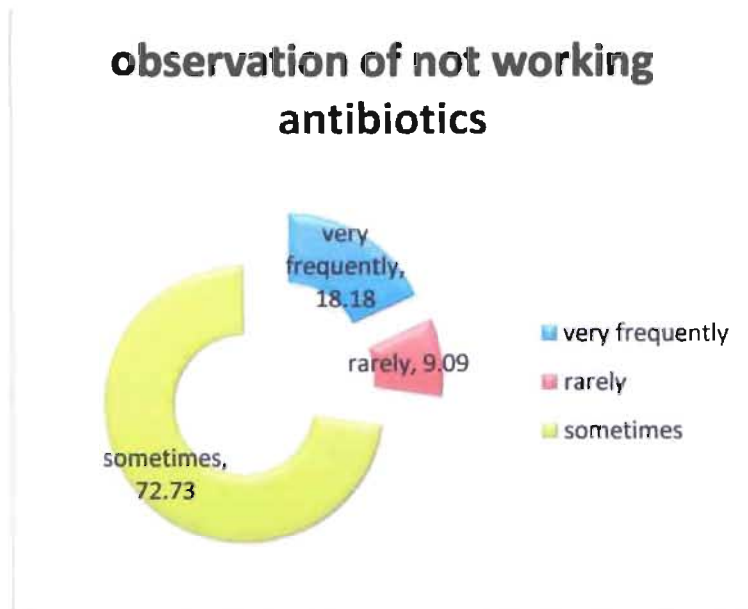


Fig: Result in Doughnut chart:

Report shows that when doctors prescribe antibiotics, sometimes it does not show any effect (72.73%). Frequently only 18.18% doctors see this. But this is not so rare(9.09%).

**QS G. What do you do while a prescribed antibiotic is not working for a particular patient?**

Observation	No of doctors	Percentages
Complete previous & start new	3	27.27
Immediately change	3	27.27
Change after test	4	36.36
Increase dose	0	0
Add another	0	0
Others	1	9.09

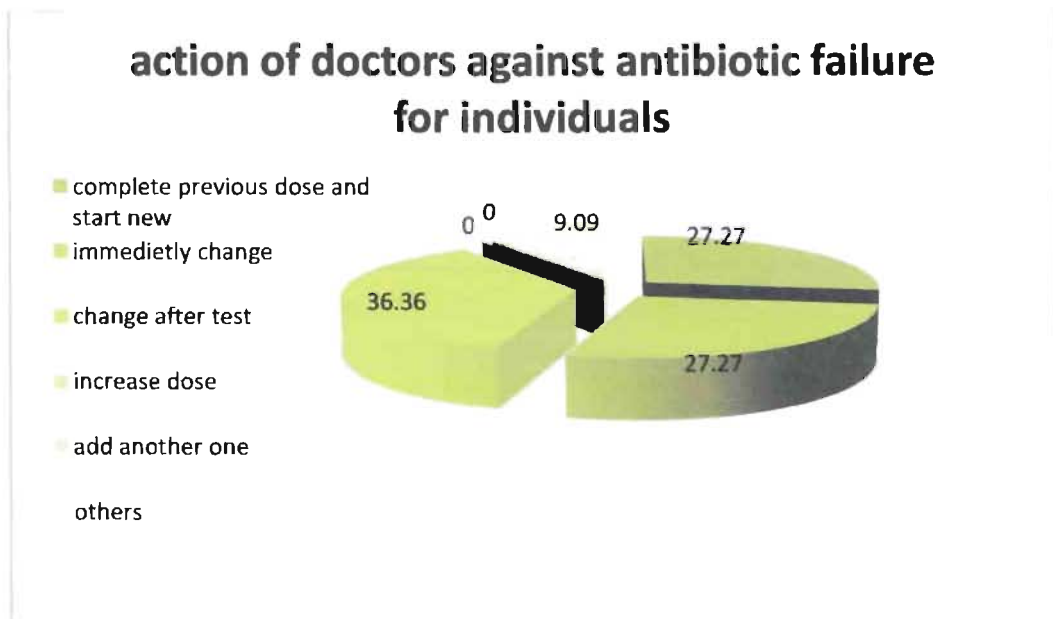


Fig: result in pie chart

Sometimes antibiotics do not work for all patients. Then doctors mainly change the drugs after the sensitivity test. Sometimes they also advice the patients to complete previous drug and start a new dose (27.27%). Some doctors also advice the patient to diagnose and then change the drug.

**QS H. Do you advice your patient in detail to complete the full course of antibiotic therapy with proper time schedule?**

Response	No of doctors	Percentages
Yes	11	100
No	0	0
Sometimes	0	0

### doctors advise for schdule

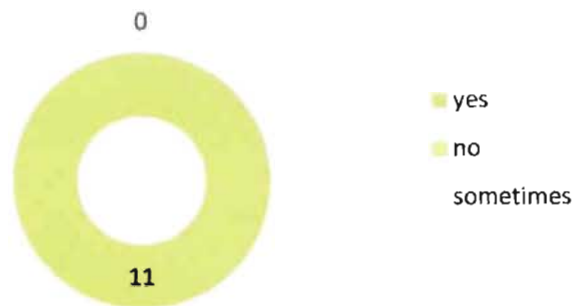


Fig: result in doughnut chart

The report shows that the doctors always advise their patients to follow the proper schedule. So the result is 100%.

**QS H: Do you think patients complete the course of antibiotics therapy in time?**

Response	No of doctors	Percentages
Yes	1	9.09
No	0	0
Not always	9	81.82
Not reporting	1	9.09



Fig: Line diagram of result

On the basis of the survey doctors says that mostly patients do not follow the therapy (81.82%). Sometimes they do not report to the doctors (9.09%).

### 3.2: Analysis Of The Data From Patients Survey:

QS.A. What is the reason of your visit to doctor?

Response	No of patients	Percentage
Cold & fever	14	28
Diarrhea	1	2
Infection	11	22
others	24	48

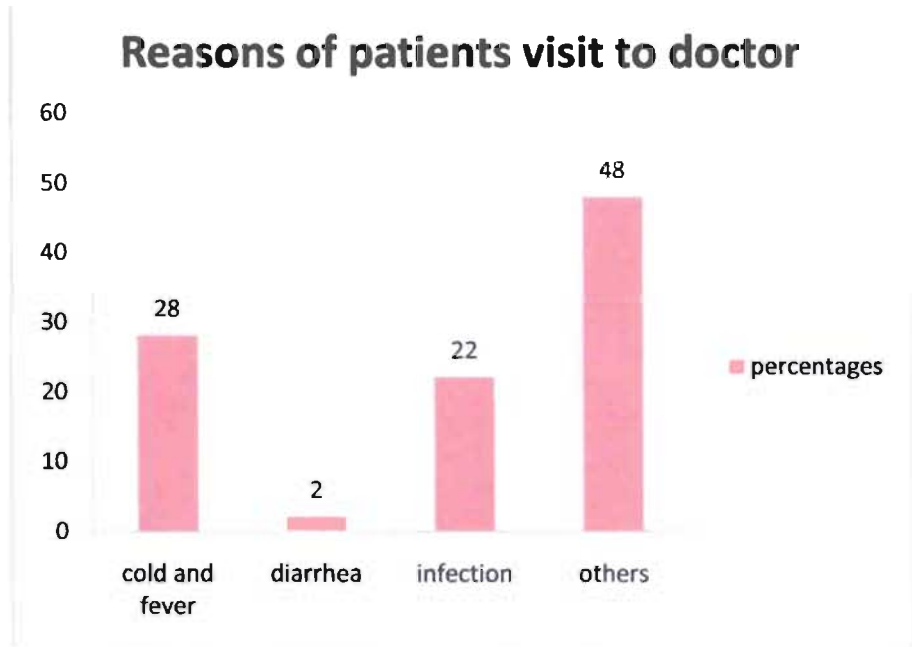


Fig: Result in Column diagram

Result shows that patients are mainly of cold, fever (28%) or infection (22%). Other disease includes maternal problems mainly (48%).

**QS.B. Do you know for what purpose antibiotics are used?**

Response	No of patients	Percentages
Bacterial infection	11	22
Cold/ fever	7	14
Pain	6	12
Any disease	26	52

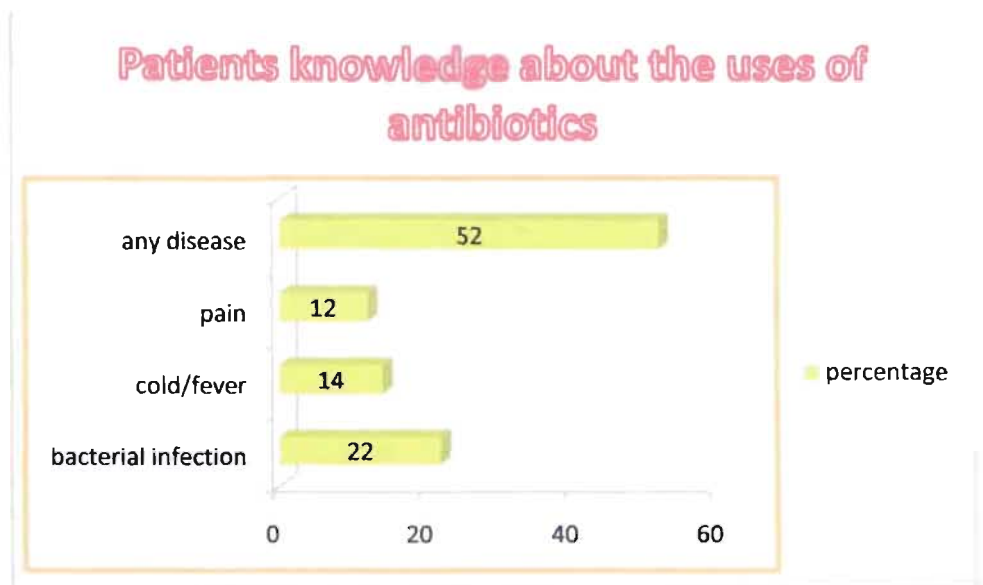


Fig: results in Bar diagram

Patients think that antibiotics can be used in any disease (52%). A medium percent (22%) patient think that antibiotic is used in any bacterial information.

**QS.C. Do you know antibiotic is a prescription drug?**

Response	No of patients	Percentages
Yes	17	34
No	33	66

**Response of patients about their awareness about prescribed drug antibiotic**

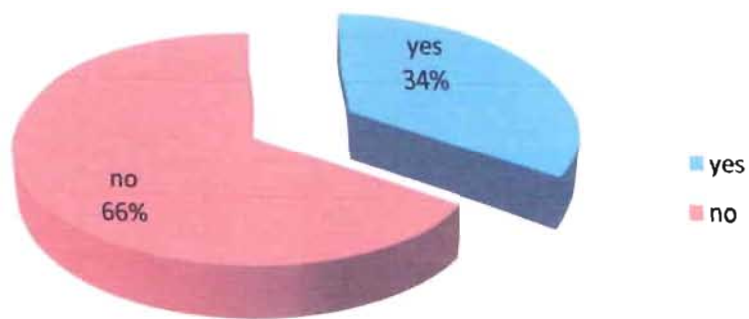


Fig: results in Pie diagram

From the report I get that 66% of the patients do not know that antibiotics are prescribed drug. Only 34% knows that it can not be taken without doctors prescription.

**QS.D. How often do you buy antibiotics without doctors prescription?**

Response	No of patients	Percentages
Frequently	7	14
Sometimes	17	34
Never	26	52

**How often patients uses unprescribed antibiotics**

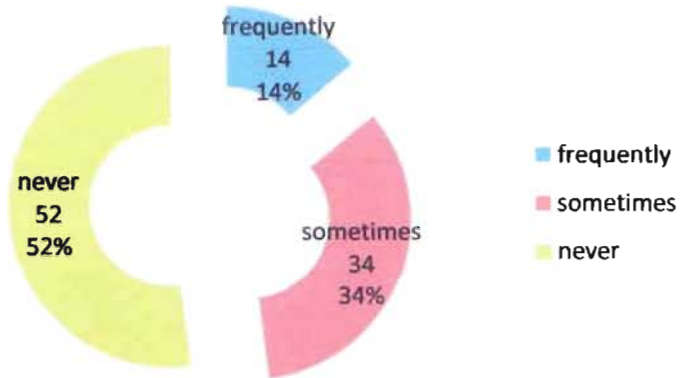


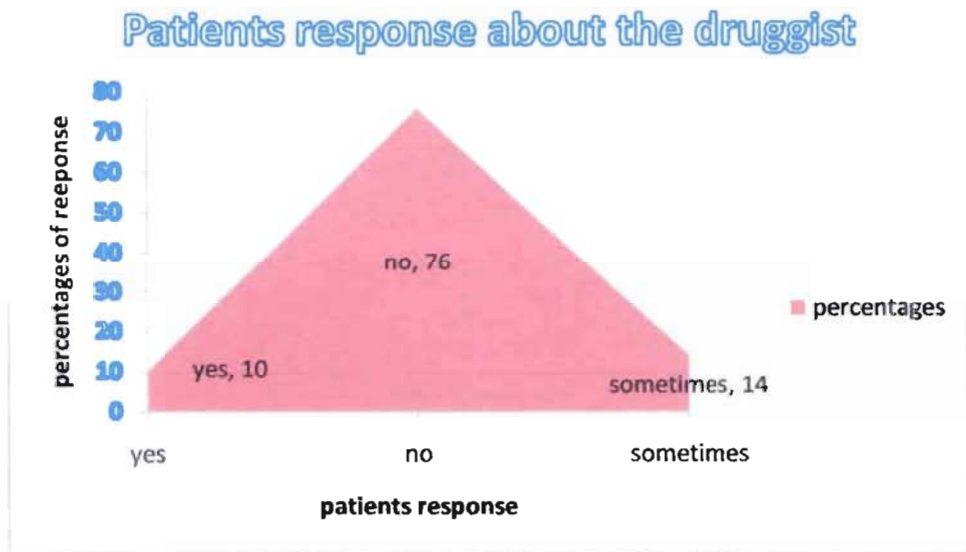
Fig: results in Doughnut diagram

From report, patient using unprescribed drug are small in percentage (14.14%). But 34.34% people uses antibiotics without prescription sometimes in different cases.



**QS.E. Does druggist of a drug store resists you from buying antibiotics without prescription?**

Response	No of patients	Percentages
Yes	5	10
No	38	76
Sometimes	7	14



**Fig: results in Area chart**

In Bangladesh most druggist do not resist a patient to buy a non prescribed drug (76%).

**QS.F. Do you store antibiotics at your home for future use?**

Response	No of patients	Percentsges
Yes	8	16
No	39	78
Always	0	0
Sometimes	3	6



Fig: Results in line chart

This is a great hope that today's rural patient has minimum level of consciousness ,that they do no preserve drugs for the future in home (78%).

**QS.G. Do you buy antibiotics without prescription for your children?**

Response	No of patients	Percentages
Always	1	2
Sometimes	12	24
No	37	74

**Use of antibiotics of patients for their children without prescription**

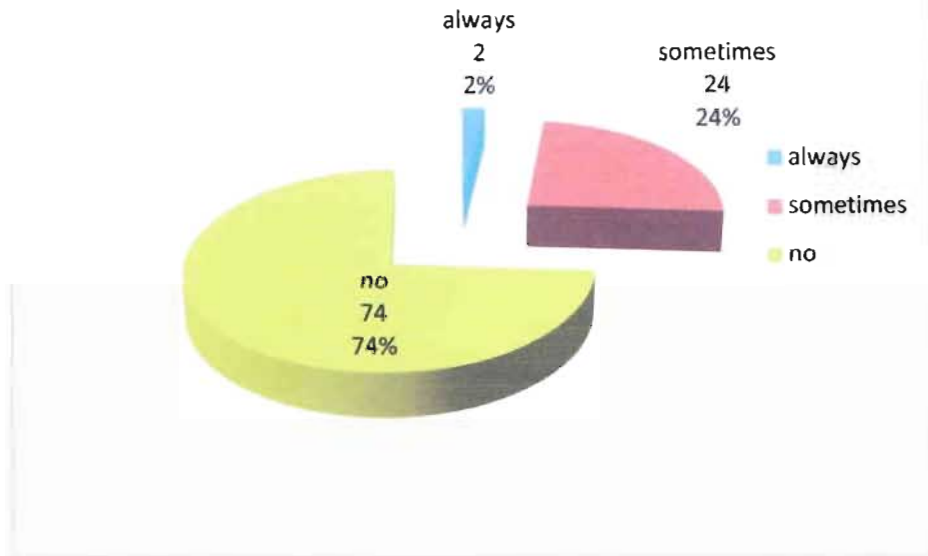


Fig: Results in Pie chart

Most of the patients do not use antibiotics for their children without doctor's prescription (74%). But some patient still use drugs like this sometimes (24.24%).

**QS.H. Do you take antibiotics from the first day of fever by yourself?**

Response	No of patients	Percentages
Yes	7	14
No	37	74
Sometimes	6	12

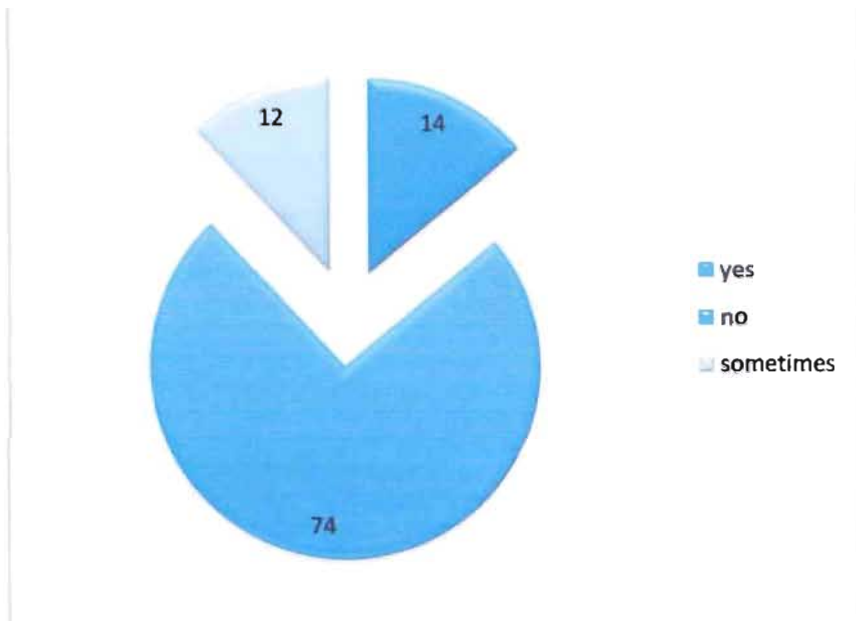
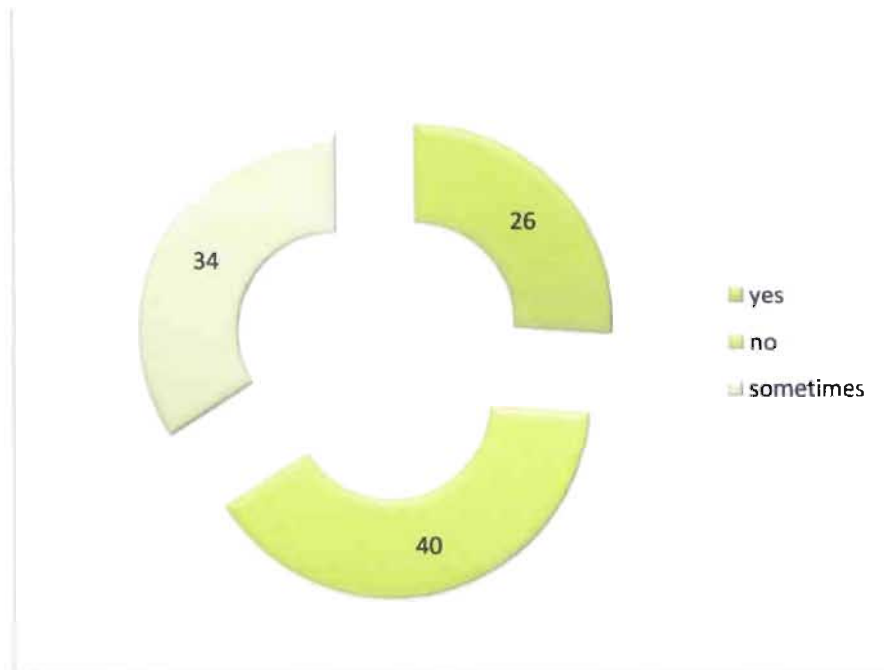


Fig: Results in pie diagram

Patient do not use drugs from the first day of the fever (74%). But minority is always present (14%).

**QS.I. Do you complete full course of antibiotic medication?**

Response	No of patients	Percentages
Yes	13	26
No	20	40
Sometimes	17	34



**Fig; Results in Doughnut diagram**

50.50% people complete the course perfectly. But 36.36% do not complete their dose.

**QS.J. Do you follow the doctor's advice to maintain time schedule during the course of antibiotic therapy?**

Response	No of patients	Percentages
Yes	15	30
No	3	6
Sometimes	32	64

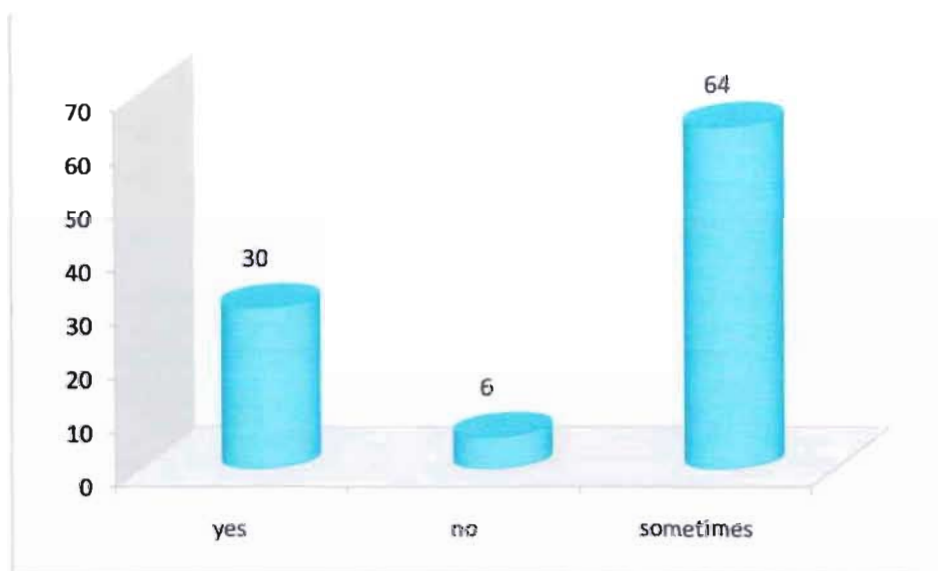
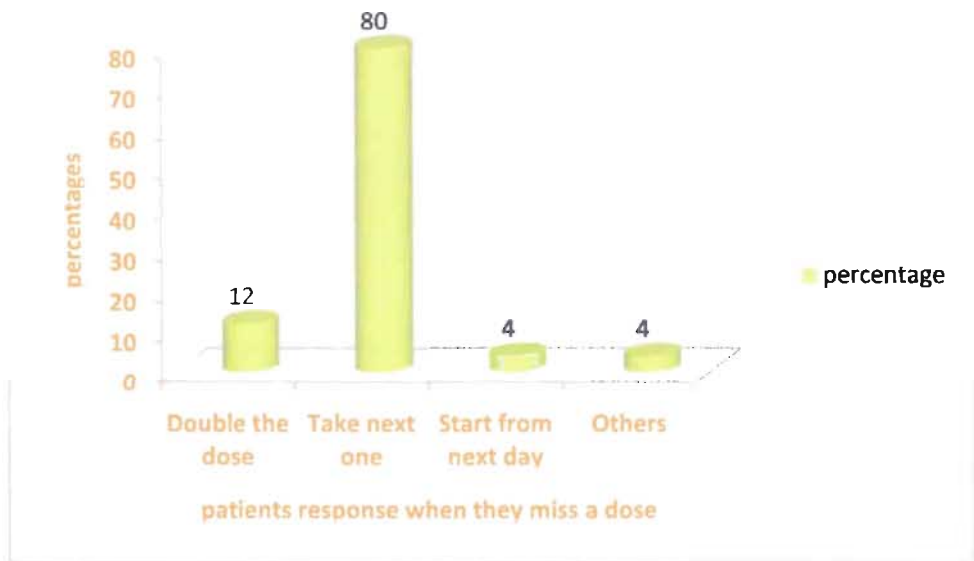


Fig: results in Cylinder column chart

64% of patients do not follow the doctors advice all time. Only 30% patient follows the schedule.

**QS.K. If u forget to take the next dose, what do you do?**

Response	No of patients	Percentages
Double the dose	6	12
Take next one	40	80
Start from next day	2	4
Others	2	4



**Fig: Results in Cylinder column chart**

Report shows that about 80% patient leave the dose if they forget to take it. The dose 12% make the dose double.

### QS.L. When do you stop taking antibiotics?

Response	No of patients	Percentages
After completion of course	16	32
when symptoms disappear	34	68

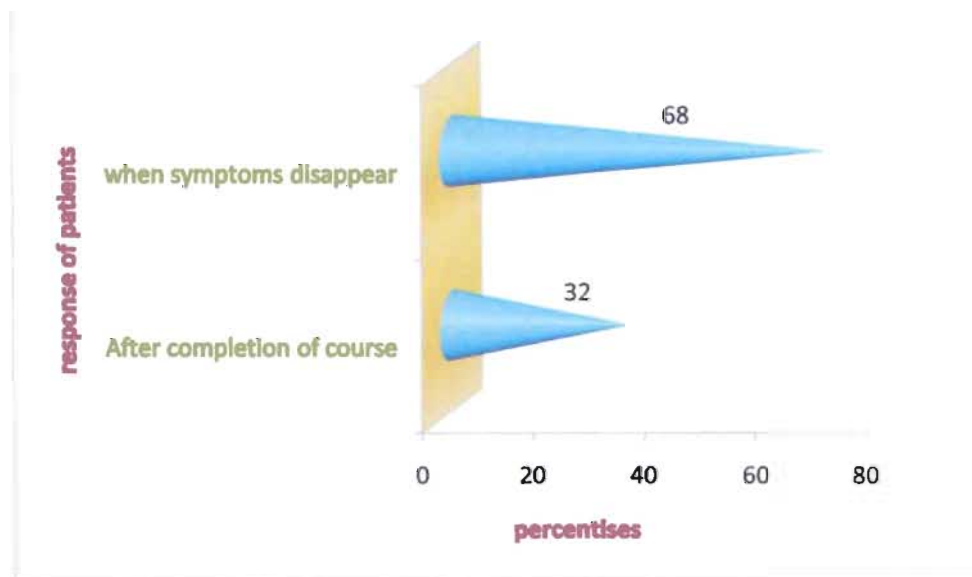


Fig: Results in Colon bar diagram

About 88% patient stop their course when the symptoms are gone. Only 32 % people finish the course.



**QS.M. Have you ever faced prescription alteration by druggist during buying of antibiotics?**

Response	No of patients	Percentages
Yes	25	50
No	18	36
Sometimes	7	14

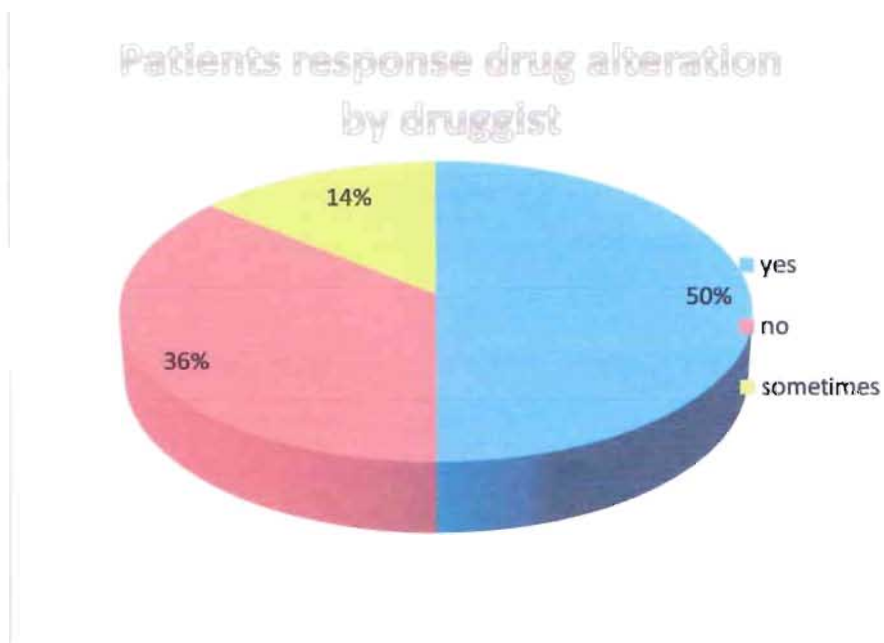


Fig: results in Pie chart

50% patients said that druggist sometimes changes the drug. But 36% s that druggist do not change the drug.

**Age variation of the patients:**

Age range	No of patients	Percentages
15-20	5	10
21-25	15	30
26-30	13	26
31-35	1	2
36-40	4	8
41-45	3	6
46-50	1	2
51-55	0	0
56-60	5	10
61-65	1	2
66-70	1	2
71-75	0	0
76-80	1	2

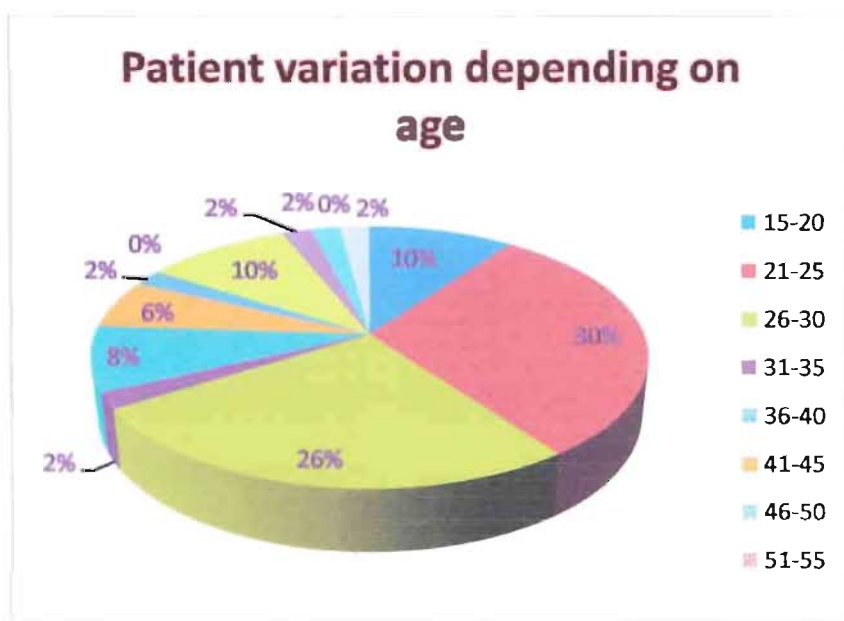


Fig: Percentages of patient variation depending on age

## Level of education

Variations	No of patients	Percentage
No education	15	30
S.S.C.	30	60
H.S.C.	4	8
Graduate	1	2

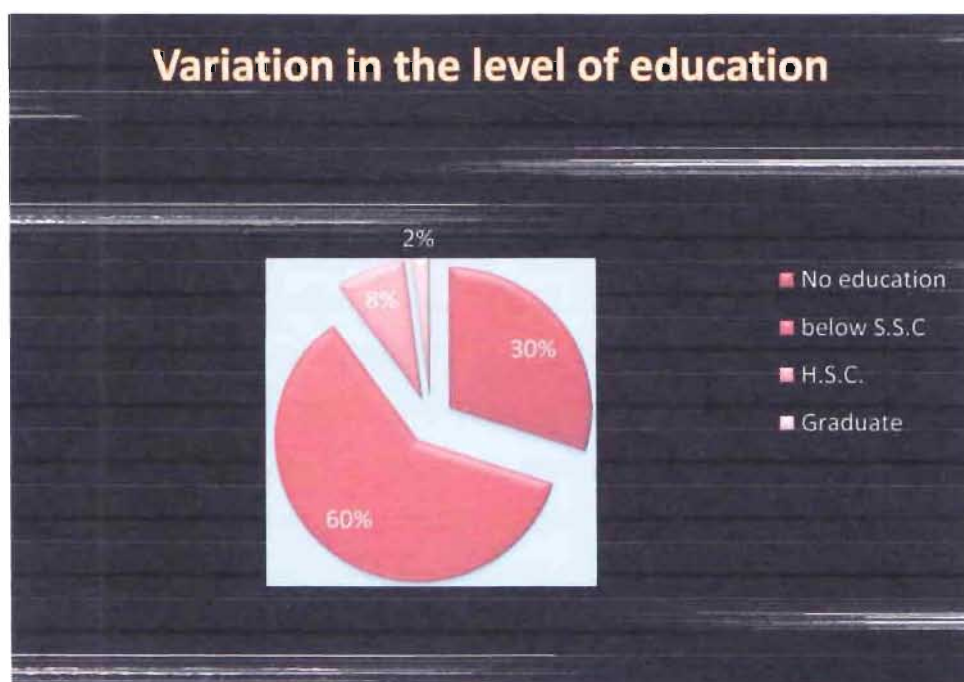


Fig: variation of the patients depending on the level of education

## ***DISCUSSION***

Excessive clinical use (misuse) is at least partially responsible for the escalating rates of resistance. The unnecessary prescription of antibiotics seen in industrialized nation has also been documented in many developing countries. Particularly in case of acute infantile diarrhea and viral respiratory infections health workers in many developing countries, including Bangladesh have an almost no access to objective health information. Pharmaceutical company representatives influence doctor's prescription habits. The purchase of small sample is exceedingly common, particularly for most customers, who buy without prescription. Patterns of drug prescribing, uses, availability, affordability and dispensing in Bangladesh are very crucial at present. The existing systems should be reformed in order to ensure better utilization of therapeutic drugs in the country. The following recommendations can be suggested based on present study in inter-disciplinary approach involving physicians, nurses, pharmacists, economists, sociologists, communication specialists, manufacturers and others should address the problem of inappropriate use of drug. The policy makers, manufacturers and the medical professionals should be committed to uphold the status of public health systems of the country through the implementation of the noble objectives of the NDP. The drug regulating authority should increase drug testing facilities and man power in order to control the quality of all the medicines available. The price controlling mechanisms should be stricter to ensure easy affordability of essential medicines in the country. Post marketing surveillance and adverse drug reaction monitoring should be initiated for all the currently marketed drugs. Mass media like radio, television and news papers can be used to create awareness and to educate the consumers about dos the don'ts of rational drug uses. Participation of local and international NGOs are necessary to promote high quality and rational use of drugs. Drug sellers should be trained properly to minimize inappropriate drug dispensing and recommendations. In this survey the most important cause reported by physician of antibiotic abuse are inadequate interactions of patient and physician are often, because of limited number of physician in Shariatpur upozilla Health complex. Many drugs are expensive for those patients are unable to complete the full

course because they are poor and discontinue the treatment when symptoms disappear before the pathogen is eliminated. However, most of the patient (80%) discontinues the antibiotic when symptoms disappears and they also take antibiotics for cold and fever without consulting doctors and doctors prescribe antibiotics without diagnostic test.



## ***CHAPTER FOUR:***

## ***CONCLUSION***

## *CONCLUSION*

Bangladesh is an overpopulated country. About 75% of the total population living in the rural area and 36% of the population live below the poverty line. Many people also live in the streets of difference cities. So, the problem of antibiotic resistance is growing rapidly in our country. From the survey I observed that many patients are not able to pay for consulting doctors and buying drugs. For this reason they are fully dependent on the health care facilities provided by the government. More over Bangladesh is a developing country and sometimes government can not fulfill the demand of primary health care of the people properly. Most of the time the supply of the essential drug by the government for primary health care is in sufficient and many times patients are not able to buy drugs. For this reason, the rate of incomplection of antibiotic course is increasing, which is the major cause of developing antibiotic resistance. Doctors sometimes prescribe antibiotic where it is not necessary such as cold and fever. The diagnostic facilities of the primary health care level are very poor. For this reason most of the time doctors prescribe antibiotics without confirming the cause of the disease. All this factors contributes to the irrational use of antibiotic and rapid development of antibiotic resistance.

To stop the irrational use of antibiotic, sufficient information should be provided to the doctors about the rational use of antibiotic in case of different infectious disease. The laboratory facilities are also needed to be improved at the primary health level,. Massive awareness building campaigns should be taken to educate patients regarding the vital importance of completing the course of antibiotic and the dangers of misuse of antibiotics.

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**CHAPTER FIVE:**



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***APPENDIX***

***CHAPTER SIX:***

## *APPENDIX*

INTERVIEWER	Name of the patient
Name: Nadia Munsef	Address
ID:2007-3-70-052	Age Sex male or female
	Education

1. What is the reason of your visit to doctor?

Cold & fever /diarrhea/infection/others (specify):

2. Do you know for what purpose antibiotics are used?

For bacterial infection/cold or fever/pain/any disease

3. Do you know antibiotic is a prescription drug?

Yes/No

4. How often do you buy antibiotics without doctor's prescription?

Frequently/sometimes/never.

5. Does druggist of a drug store resist you from buying antibiotics without prescription?

Yes/No/Sometimes.

6. Do you store antibiotics at your home for future use?

Yes/No/Always/Sometimes

7. Do you buy antibiotics without prescription for your children?

Always/Sometimes/No

8. Do you use antibiotics for cold and fever without prescription?

Yes/No/Sometimes

9. Do you take antibiotics from the first day of fever by yourself?

Yes/No/Sometimes

10. Do you complete full course of antibiotic medication?

Yes/No/Sometimes

11. Do you follow the doctor's advice to maintain time schedule during the course of antibiotic therapy?

Yes/No/Sometimes

12. If you forget to take the next dose, what do you do?

Double the dose/take the next dose/start from next dose/others

13. When do you stop taking antibiotics?

After completion of course/when symptoms disappear

14. Which antibiotic brand you usually buy without prescription?

Brand name:

Dose.....mg.....times daily for.....days

15. Do you take same antibiotics therapy for different disease?

Yes/No/Sometimes

16. Do you have any experience that you have taken antibiotics that did not work?

Yes/No/if the answer is yes then ask which antibiotic for which disease?

17. Have you ever faced prescription alteration by druggist during buying of antibiotics?

Yes/No/Sometimes

INTERVIEWER

Name of the physician

Name: Nadia Munsef

Specialization

ID: 2007-3-70-052

Work place

1. Do you think antibiotics should be prescribed only after conformation of infection?

Yes/No/Sometimes

2. When do you prescribe antibiotics in cold and fever?

After suspicion of bacterial infection/some times due to patient's request/after conformation of infection with diagnostic test

3. How frequently do you prescribe antibiotic after confirming antibiotic susceptibility test?

Very frequently/sometimes/Rare

4. In case of empirical antibiotics therapy, which group of antibiotics do you prefer most?

Penicillin/Cephalosporin/fluroquinolone/Macrolides/others

5. Do you prescribe more than one antibiotic at a one time during empirical practice?

Yes/No/not always

6. Which antibiotics do you prefer most for the pregnant and lactating mother?

.....

7. Which antibiotics do you prefer most for the children?

.....

8. When do prescribe an injectable antibiotic although oral dosage form is available?

.....

9. What are the factors that play most significant role in antibiotic resistance?

Overuse/Tendency of patients not to stick to the therapy till completion of course/Wrong selection of antibiotic/other (please specify)

10. How frequently do you observe that an antibiotic you prescribe is not working for a particular patient?

11. Very frequently/Rarely/sometimes

12. what do you do While a prescribed antibiotic is not working for a particular patient?

Complete the previous dose and start new therapy/immediately change the antibiotic/change the antibiotic after antibiotic sensitivity test/increase the dose/add another antibiotic/others(please specify)

13. Is there any correlation between antibiotic prescription and patient satisfaction?

Yes/no

13. Do you advice your patients in details to complete the full course of antibiotic therapy with proper time schedule?

Yes/no/sometimes

14. do you think patient complete the course of antibiotic therapy in time?

Yes/no/not always/no reporting