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Knowledge, attitude and practice towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand.

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Knowledge, Attitude and Practice towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand.

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ความรู้ เจตคติและการปฏิบัติตนต่อการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลของนักท่องเที่ยวเชิงสุขภาพชาวบังคลาเทศในกรุงเทพมหานคร ประเทศไทย

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คาชิ ซาบินา อาร์จู : ความรู้ เจตคติและการปฏิบัติตนต่อการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลของนักท่องเที่ยวเชิงสุขภาพชาวบังคลาเทศใน กรุงเทพมหานคร ประเทศไทย. (Knowledge, Attitude and Practice towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand.) อ.ที่ปรึกษาหลัก : เนาวรัตน์ กาญจนาคาร

ยาปฏิชีวนะเป็นยาที่ใช้เฉพาะในการป้องกันและรักษาการติดเชื้อแบคทีเรีย การดื้อยาของเชื้อแบคทีเรียมีแนวโน้มที่ทำให้ค่าใช้จ่ายทางการแพทย์สูงขึ้น ยืดระยะเวลาการพักในโรงพยาบาลและเพิ่มอัตราการเสียชีวิตของผู้ป่วย ปัจจุบันปัญหาการดื้อยาของเชื้อแบคทีเรียจึงเป็นสิ่งท้าทายทางสาธารณสุขของโลก การใช้ยาปฏิชีวนะเกินจำเป็นและใช้ยาอย่างไม่สมเหตุสมผลเป็นปัจจัยสำคัญยิ่งที่ทำให้เกิดเชื้อดื้อยา การเดินทางระหว่างประเทศทั่วโลกของนักท่องเที่ยวอาจเป็นสิ่งที่เร่งให้ปรากฏการณ์นี้เกิดรวดเร็วขึ้นได้ วัตถุประสงค์ของการศึกษานี้เพื่อต้องการให้เห็นถึงช่องโหว่ของปัญหาและหาปัจจัยที่เกี่ยวข้องทางสังคมโดยการประเมินระดับความรู้ ทัศนคติ และการปฏิบัติตนเกี่ยวกับการใช้ยาปฏิชีวนะของนักท่องเที่ยวเชิงสุขภาพชาวบังคลาเทศในกรุงเทพมหานคร ประเทศไทย การวิจัยเชิงสำรวจนี้เก็บข้อมูลโดยใช้แบบสอบถามแบบให้ผู้เข้าร่วมวิจัยตอบด้วยตนเองซึ่งประกอบด้วยเนื้อหา 4 ส่วนหลัก การเลือกผู้เข้าร่วมวิจัยทำแบบตามสะดวก โดยมีช่วงอายุระหว่าง 18 ถึง 75 ปีและสามารถตอบแบบสอบถามได้ การวิจัยนี้มีผู้ร่วมวิจัยทั้งสิ้น 362 คน การวิเคราะห์ข้อมูลใช้โปรแกรมเอสพีเอสเอสเวอร์ชัน 22 และสถิติที่ใช้ได้แก่ ไคสแควร์ สเปียแมน แรงค์ คอร์เรชันเทส จากผลการทดลองพบว่าผู้เข้าร่วมวิจัยส่วนใหญ่เป็นผู้ชาย (56.4%)ที่เหลือเป็นผู้หญิง (43.6%) ส่วนใหญ่อายุอยู่ในช่วง 33-47 ปี (45.6%) นับถือศาสนามุสลิม (81.2%) แต่งงานแล้ว (70.4%) สำเร็จการศึกษาระดับปริญญาโทหรือสูงกว่า (48.1%) ส่วนใหญ่มีอาชีพทำธุรกิจ (39.2%) ผู้เข้าร่วมวิจัยส่วนใหญ่ (56.4%) ไม่มีสมาชิกในครอบครัวที่มีอาชีพเกี่ยวข้องกับสุขภาพ ผู้ร่วมวิจัย 58.0%ใช้ยาปฏิชีวนะในช่วง 1 ปีที่ผ่านมาและ55.2%ของผู้เข้าร่วมวิจัยยังใช้ยาประเภทอื่นร่วมด้วย เมื่อประเมินระดับความรู้ของผู้เข้าร่วมวิจัยเกี่ยวกับการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลพบว่าส่วนใหญ่ (46.4%) มีความรู้อยู่ในระดับปานกลาง รองลงมาจะอยู่ในระดับดี (44.2%)โดยมีค่าคะแนนเฉลี่ย 15.7±2.81 คะแนน มีค่าคะแนนสูงสุด 21 คะแนน มีค่าคะแนนต่ำสุด 8 คะแนน ผู้ร่วมวิจัยส่วนใหญ่ (67.7%) มีทัศนคติอยู่ในระดับปานกลางโดยมีคะแนนเฉลี่ย 83±7 คะแนนสูงสุด 102 คะแนน ต่ำสุด 59 คะแนน ผู้เข้าร่วมวิจัยส่วนใหญ่ (72.4%) มีคะแนนการปฏิบัติตนต่อการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลอยู่ในระดับปานกลางโดยมีคะแนนเฉลี่ยที่ 71±6 คะแนนสูงสุด 85 คะแนนต่ำสุด 51 คะแนน จากผลการวิจัยยังพบว่าผู้ที่ใช้ยาปฏิชีวนะในรอบ1ปีที่ผ่านมามีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับความรู้ การมีสมาชิกในครอบครัวที่มีอาชีพเกี่ยวข้องกับสุขภาพ และยังพบความสัมพันธ์อย่างมีนัยสำคัญทางสถิติระหว่างปัจจัยทางด้านการศึกษา (P=0.002) จำนวนสมาชิกในครอบครัวที่มีอาชีพเกี่ยวข้องกับสุขภาพ (P=0.001) และการได้รับยาปฏิชีวนะในรอบ 1 ปีที่ผ่านมา (P=0.008) กับทัศนคติ เกี่ยวกับเรื่องการปฏิบัติตนต่อการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลพบความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับการมีสมาชิกในครอบครัวที่มีอาชีพเกี่ยวข้องกับสุขภาพ (P=0.002) ยังพบความสัมพันธ์ทางด้านบวกในระดับปานกลางระหว่าง ความรู้กับทัศนคติ (r=0.473, P<0.001)และความสัมพันธ์ระหว่างทัศนคติกับการปฏิบัติตนต่อการใช้ยาปฏิชีวนะอย่างสมเหตุสมผล (r=0.436, P<0.001) งานวิจัยนี้ทำให้เห็นว่าผู้ที่มีระดับคะแนนทัศนคติสูงมักจะมีคะแนนการปฏิบัติตนต่อการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลสูงด้วยเช่นกัน ประเด็นการใช้ยาปฏิชีวนะอย่างเหมาะสมยังคงเป็นปัญหาสำคัญระดับโลกที่ต้องเร่งแก้ไขและพัฒนา จากผลงานวิจัยนี้ชี้ให้เห็นว่าควรต้องจัดทำโปรแกรมความรู้เกี่ยวกับเรื่องนี้ให้กับประชาชนที่ยังต้องพึ่งพายาปฏิชีวนะกันอย่างกว้างขวางให้พึงระวังในการใช้ยาปฏิชีวนะอย่างสมเหตุสมผลเพื่อป้องกันการดื้อยาต่อไป

สาขาวิชา	สาธารณสุขศาสตร์	ลายมือชื่อนิสิต .....
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Kazi Sabina Arju : Knowledge, Attitude and Practice towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand. . Advisor: Asst. Prof. NAOWARAT KANCHANAKHAN, Ph.D.

Antibiotics are special drugs used for the prevention and treatment of bacterial infections. Antibiotic resistance tends to increase medical expenses, prolonged hospital stays, and increased death rate. Nowadays, antibiotic resistance is one of the most challenges to global public health. Excessive and inappropriate use of antibiotics plays an important role in increasing antibiotic resistance. Antibiotic resistance is becoming a global health problem, because the ease of international travel may increase the rapid spread of resistant microorganisms around the world. The aim of this study to strengthen the research gap and to describe the socio-demographic factor and to assess the level of knowledge, attitude, and practices of antibiotic use of Bangladeshi medical tourist in Bangkok, Thailand. A Cross-sectional study was conducted by a structured self -administered questionnaire which consist of 4 parts. Participants were selected according to convenience sampling method, the age limit was 18 to 75 years and able to response questionnaire. A total number of participants were 362. SPSS version 22 software was used for data analysis. Descriptive statistics, Chi-square and Spearman rank correlation test were used to analyze data. Most of the study participants were male 56.4 %, rest others are female 43.6%, majority 45.6% are age group 33-47 years old. Most of the participants 81.2% are believers in Islam, 70.4% are married,48.1%completed their master's degree or higher education, 39.2% mentioned business as a profession, majority 87.8% replied no family member related with health profession.58% used antibiotics within the last 1year, 55.2% used any other medication, majority 71.3% had the co-morbid disease. Majority 46.4% had a moderate level of knowledge followed by 44.2% of participants had a good level of knowledge. Mean knowledge score was 15.7±2.81, maximum knowledge score was 21 and minimum knowledge score was 8. Majority 67.7% of the study participants had a moderate level of attitude followed by 17.1 % had a good level of attitude. Mean attitude score was 83±7, maximum attitude score was 102 and the minimum score was 59. Majority 72.4% of the study participants had a moderate level of practice followed by 15.2% had good practice towards the rational use of antibiotics. Mean practice score was 71±6, Maximum practice score was 85 and the minimum score was 51. People who received antibiotics within the last 1year had a significant association with knowledge (P = 0.002). People who were more educated (P = 0.004) , family member related with health profession(P = 0.001) and received antibiotic within last 1year (P = 0.008) had significant association with attitude. People who had family member related to the health profession(P=0.002) had a significant association with practices of antibiotics use. There was moderately strong positive correlation between knowledge and attitude which is statistically significant (r=0.473, P- <0.001), there was a moderately strong positive correlation between attitude and practice which is statistically significant (r=0.436, P- <0.001), study subjects who had good attitude more likely to have good practices towards antibiotic use. The issue of rational use of antibiotics have been seriously considered worldwide and the appropriate solution should be developed. It is very important to know the level of knowledge, attitude, and practices in people who use antibiotics and need awareness program to educate people more about antibiotic resistance.

Field of Study:	Public Health	Student's Signature .....
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Kazi Sabina Arju

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WHO- World Health Organization

URTI-Upper respiratory tract infection

GI- Gastro-Intestinal

RTI- Respiratory tract infection

UTI-Urinary Tract infection

ABR- Antibiotic Resistance

AMR-Antimicrobial Resistance

MDR-Multi drug Resistance

ESBL-Extended spectrum beta lactamases

HGT-Horizontal gene transfer

DNA-Deoxyribonucleic acid

OTC-Over the counter

DDA-Directorate of drug administration

DGDA-Directorate general of Drug administration

DRA-Drug Regulation authority

MoHFW- Ministry of Health and Family Welfare

NDP- National Drug Policy

KAP-Knowledge , attitude ,practice

OPD-out patient department

IMS-International Medical Services

BMS-Bangladesh Medical Services

CHAPTER I

INTRODUCTION

1. BACKGROUND & RATIONAL

Antibiotics are special drugs that used for prevention and treatment of bacterial infections. Antibiotic resistance happens when bacteria tends to change in response to the use of these drugs. Bacteria itself become antibiotic-resistant not humans or animals. These resistant bacteria may cause to spread infection to humans and animals, and this infections that caused by resistance organism very difficult to treat from those caused by non-resistant bacteria. Antibiotic resistance tends to increase medical expenses, prolonged hospital stays, and increased death rate(WHO, 2018a).

Antibiotics are the major drugs that made our life free from infections. Antibiotics are not only for essential drugs for mankind but also has a essential role in non-medical applications e.g. growth of livestock , to prevent contamination, for the treatment of blight in orchards .But overuse of antibiotics threatens drug efficacy and spread of antibiotic resistance bacteria. Prevalence of drug resistance bacteria is increasing more than before because no new antibiotics discovered in last 20-30 years . Thus, essential drugs becoming very limited to fight against resistance organism and bacteria could be resistance to multiple agents at a time (Richardson, 2017).

Now a days ,antibiotic resistance is one of the biggest challenges to global public health . Excessive and inappropriate use of antibiotics play important role to increasing antibiotic resistance. Use of poor quality and low standard antibiotics accelerating the rise of antibiotic resistant bacteria. Low standard and poor quality of medicine are a significant problem for low and lower middle income countries. The prevalence of antibiotic resistance is more in communities where there is use of non-prescription drugs . In lower middle income countries has high prevalence of self-medication of antibiotics, penicillin is the most common self-medication drugs group.

Self-medication mainly related with URTI(upper respiratory tract infection)fever, GI problems. Self-medication also tends to inappropriate use including wrong indications and inappropriate duration of medication(Tangcharoensathien, Sommanustweechai, Chanvatik, Kosiyaporn, & Tisocki, 2018).

Infections caused by resistance bacteria are becoming hard or even impossible with most available antibiotics agent, which tends to increase morbidity and mortality. Even many common human pathogens e.g. *E.coli*, *Klebsiella* spp., *Pseudomonas* spp. are resistant to antibiotics and becoming deadly to human. However many resistance bacteria came from natural environment like bacteria from soil , water. Antibiotic resistance not only a local public health issue but also has environmental influences which are triggered by international travel and global trade of foodstuffs (Finley et al., 2013).

Antibiotic resistance is becoming a global health problem, because the ease of international travel may increasing rapid spread of resistant microorganisms around the world. Infections with resistant microorganisms can occur everywhere like in hospitals or in community settings. In community resistance can result from nosocomial infection from drug resistance pathogen, or improper use within community or as a result of travel. Antibiotic resistance can also occur as a result of inappropriate use of antibiotic agents in animals (Diseases, 1997).

Antibiotic resistance has becoming a developing threat to the treatment of an ever-increasing range of infections due to bacteria. Antibiotic resistance results in reduced efficacy of antibacterial drugs, making the treatment challenging and expensive. According to WHO Fact sheet 2018 antibiotic resistance happens when microorganism change structure when they are introduce with specific drug. Microorganism which develops resistance sometimes called as “superbugs”. This kind of Microorganism becoming powerful against any kind of medicine hence infections continue to exist in body and spread to others(WHO, 2018b).

Antibiotic resistance is a global problem. Antibiotics are the most frequently used group of drugs in common practice and in hospital settings . Bangladesh is a densely

populated country , where infectious disease is basic public health problem, hence widespread use of various antibiotics against different microorganism such as bacterial infection is required. The important characteristics related with resistant bacteria are bad hospital hygiene, overpopulation , absence of material for infection control and shortage of trained people for controlling infection in hospital. Lack of communication between patient and physician, lack of proper monitoring of antibiotic selling are also the alarming reason rising of antibiotic resistance (Basher*, 2011; Uddin et al., 2017).

Antibiotic resistance is a global public health concern with a huge economic and clinical load to every nation . The World Health Organization(WHO) report that this resistance causes increase mortality of twenty five thousands folks each year in the European hospitals with a huge economic burden of one and half billion of Euro (Scaioli et al., 2015).

Antimicrobial resistance (AMR) is a prime global health problem. Approximately three hundred millions of people will fall in death prematurely just for infectious diseases as a result of antimicrobial-resistant organisms over the next thirty five years (ten million deaths per year), Global gross domestic product tends to lower by 2%-3.5% by 2050. If this drug resistance is not effectively tackled world may expect to lose sixty to hundred trillion US dollars in economic output from 2014-2050. (Rattanaumpawan, Boonyasiri, Vong, & Thamlikitkul, 2018).

Infections with common microorganism or tiny injuries may result death due to antibiotic resistance , this is a warning from World Health Organization(WHO).WHO also warned about post-antibiotic era may leads to increase deaths around worldwide. Two million people are affected by resistance pathogen and 63,000 people might die each year from hospital acquired infection in USA (Sutthiruk et al., 2018; Zaman et al., 2017).

In Thailand, approximately ninety thousands patients are affected by resistance microorganism each year and the cost of the therapeutic use of antibiotic medications is more than two hundred million USD per year. The increase in resistance

microorganism increases more than three million extra days of hospital stay and responsible for 38,481 deaths per year in Thailand. It is estimated that an additional nineteen thousands deaths are caused by multi drug resistant (MDR) bacteria in Thailand per year(Sutthiruk et al., 2018).

Antibiotics are easily obtain as a non-prescription drug and irrational use or misuse is very common in Bangladesh like many other developing countries. Availability of these drugs as without prescription leading to inappropriate use which tends to increase in antibiotic resistance(Kumar Bishwajit Sutradhar1, 2014).

Most common diseases treated with antibiotics are RTI ,fever and UTI ,acute watery diarrhea . Fifty percent of physician prescribe antibiotics for this common illness. About ten percent of physician prescribe medicine for otitis media, dysentery, septicemia. Majority of Physician (about 70%) prescribe antibiotics before confirmation of diagnosis due to inadequate diagnostic tools . Emergence of resistant microorganism are the main reason for increasing antimicrobial prescribing. Half of the E.coli, Staphylococcus , Pseudomonas and Klebsiella showed resistance towards older and common antibiotics such as ciprofloxacin, amikacin, azithromycin , ceftriaxone , imipenem etc(Rahman & Huda, 2014; Soma, Shahriar, Narjish, & Bhuiyan, 2015).The most commonly prescribed antibiotic are ceftriaxone (30.19%) followed by cefixime (18.87%), and amoxycillin (16.98%)(Soma et al., 2015).

Mal-practices and over prescription of antibiotics are very common problem in Bangladesh. Inappropriate and irrelevant prescribing of antibiotics is a threatening concern in Bangladesh and also globally. There is a meticulous link between inappropriate use of antibiotics and development of antibiotic resistance. Therefore, proper use of antibiotics is an vital issue for patient treatment and public health issue with national preference. There are lots of factor, on which antibiotic prescription, dispensing, consumption or discarding influence subsequent human behavior depends on. Individual involved might be a doctor, a veterinarian, an animal owner, a consumer, or a parent. The engagement of a human behavior is also observed in the non–human use of antibiotics in animal husbandry, food and agriculture(Saha, 2017).

Essential drugs are one of the important medicine to improve and maintain health. But many people across the globe this essential drugs are still unaffordable, unavailable, unsafe and not properly used. Irrational use of antibiotics is a major concern around the world. Inappropriate use such as overuse , misuse of antibiotics may results health hazards. Antibiotics are most commonly sold drugs in developing countries and most sales are without prescriptions (Kanjanachaya Sirijoti1, 2014).

For decades, It was think antibiotic resistance occur only in health-care related environment. However, recent years it is found increase infection related with multidrug resistant Enterobacteriaceae, which is caused by community-acquired infections, especially with Escherichia coli . It has been observed that there is an increasing trend in the asymptomatic carriage of ESBL-producing Enterobacteriaceae in the general population. International travel play a important role in the global spread of ESBL-producing Enterobacteriaceae. International travel has a link with symptomless conveying of disease which also increased risk for community-acquired infections (Kuenzli, 2016).

Encounter with antimicrobial resistance is now a greatest concern in worldwide . With the globalization of healthcare many peoples from developed countries are travelling to Thailand. This peoples are usually known as Medical Travelers. Many Bangladeshi patients specially middle class and upper middle class are not satisfied with poor quality of domestic public health system and tend to visit private health care services. Thailand is one of the popular destination among Bangladeshi medical travelers for treatment and repeat visits. This is due to Thailand's friendly Hospitality, the quality of caring healthcare services, world class medical facilities , pharmaceutical medicine (Ali & Medhekar, 2018).

International roaming of different people often results in quick spread of resistant microorganisms around the globe. Infections with resistant microorganisms can happen in hospitals and in the community. That's why it is important for everyone to understand the underlying mechanisms, clinical consequences, and management of antimicrobial resistance(Diseases, 1997).

Social cognitive factors at an personal level such as knowledge and beliefs that usually influences health related behavior . Using antibiotics also includes in health behavior of individual. Sometimes knowledge is not enough to change behavior but knowledge play important role to shape up personal beliefs and attitude regarding a particular habit (Dr.M.Ganesh, Dr.S.A.Sridevi, & Paul, 2012).

Studies found that folks in the community settings around the globe mostly have poor knowledge, wrong attitudes, and inaccurate practices regarding irrational use of antibiotic . The studies around the globe regarding antibiotics use revealed that sociodemographic factors are related to the level of knowledge, attitude, and practice. Many research papers shows there is relationship between peoples knowledge attitude and practices towards antibiotic use (Kanjanachaya Sirijoti1, 2014).

In Bangladesh only few study done to assess peoples knowledge , attitude, and practice towards rational use of antibiotics. The people who come in Thailand to seek medical treatment are middle class or upper middle class. According to my knowledge no previous study done on this Bangladeshi medical tourist in Bangkok, Thailand. The aim of this study to strengthen research gap and to describe the socio-demographic factor and to assess the level of knowledge , attitude and practice towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok Thailand.

2.Research Questions

2.1 What is the level of knowledge level, attitude level and practice level towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand?

2.2 What are the sociodemographic characteristics of Bangladeshi medical tourist in Bangkok, Thailand?

2.3 Is there any association between sociodemographic factors and level of knowledge, attitude and practice towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand?

2.4 Is there any association between knowledge level and attitude level towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand?

2.5 Is there any association between attitude level and practice level towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand?

2.6 Is there any association between knowledge level and practice level towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand?

3 .Statistical Hypothesis

3.1 Null Hypothesis

3.1.1 There is no association between sociodemographic factor and level of knowledge, attitude and practice towards rational use of antibiotics among Bangladeshi medical tourist.

3.1.2 There is no association between knowledge level and attitude level towards rational use of antibiotics among Bangladeshi medical tourist.

3.1.3 There is no association between knowledge level and practice level towards rational use of antibiotics among Bangladeshi medical tourist.

3.1.4 There is no association between attitude level and practice level towards rational use of antibiotics among Bangladeshi medical tourist.

3.2 Alternative Hypothesis

3.2.1 There is an association between sociodemographic factors and level of knowledge, attitude, practice towards rational use of antibiotics among Bangladeshi medical tourist.

3.2.2 There is an association between knowledge level and attitude level towards rational use of antibiotics among Bangladeshi medical tourist.

3.2.3 There is an association between knowledge level and practice level towards rational use of antibiotics among Bangladeshi medical tourist.

3.2.4 There is an association between attitude level and practice level towards rational use of antibiotics among Bangladeshi medical tourist.

4. Research Objectives

4.1 General Objective:

To assess the level of knowledge, attitude and practice towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand.

4.2 Specific objectives:

4.2.1 To describe sociodemographic characteristics of Bangladeshi medical tourist in Bangkok, Thailand.

4.2.2 To assess association between sociodemographic factors and level of knowledge, attitude and practice towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand.

4.2.3 To assess association between knowledge level and attitude level towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand.

4.2.4 To determine association between attitude level and practice level towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand.

4.2.5 To determine association between knowledge level and practice level towards rational use of antibiotics among Bangladeshi medical tourist in Bangkok, Thailand.

5.Variables of the study:

5.1 Independent Variables:

5.1.1 Sociodemographic factors:

Sex

Age

Marital status

Religion

Education

Occupation

Monthly income

Any family member related with health profession

Current use of any medication

Antibiotic use within last 1 year

Department of taking treatment

Comorbid disease

5.1.2 Knowledge about rational use of antibiotics

Identification of antibiotics.

Appropriate indications of antibiotics.

Antibiotics allergy and side effects.

Knowledge about infections.

Knowledge about antibiotics resistance

Compliance and completion of antibiotic course

Leftover antibiotics

Antibiotic for children

Storage of antibiotic

5.1.3 Attitude towards rational use of antibiotics

Source of antibiotic

Appropriate indications of antibiotic

Administration of antibiotic in children and adult

Compliance and completion of antibiotic course

Leftover antibiotics

Infection control attitude

5.2 Dependent Variable

5.2.1 Practice towards rational use of antibiotics

Appropriate indications of antibiotic.

Administration of antibiotic .

Compliance and completion of antibiotic course.

Source of antibiotics and method of collection

Label reading and check for trade name, expiry date.

Self-medication.

Sharing antibiotic with others.

Antibiotic for emergency case.

Antibiotic allergy and side effects.

Storage of antibiotics.

5.CONCEPTUAL FRAMEWORK

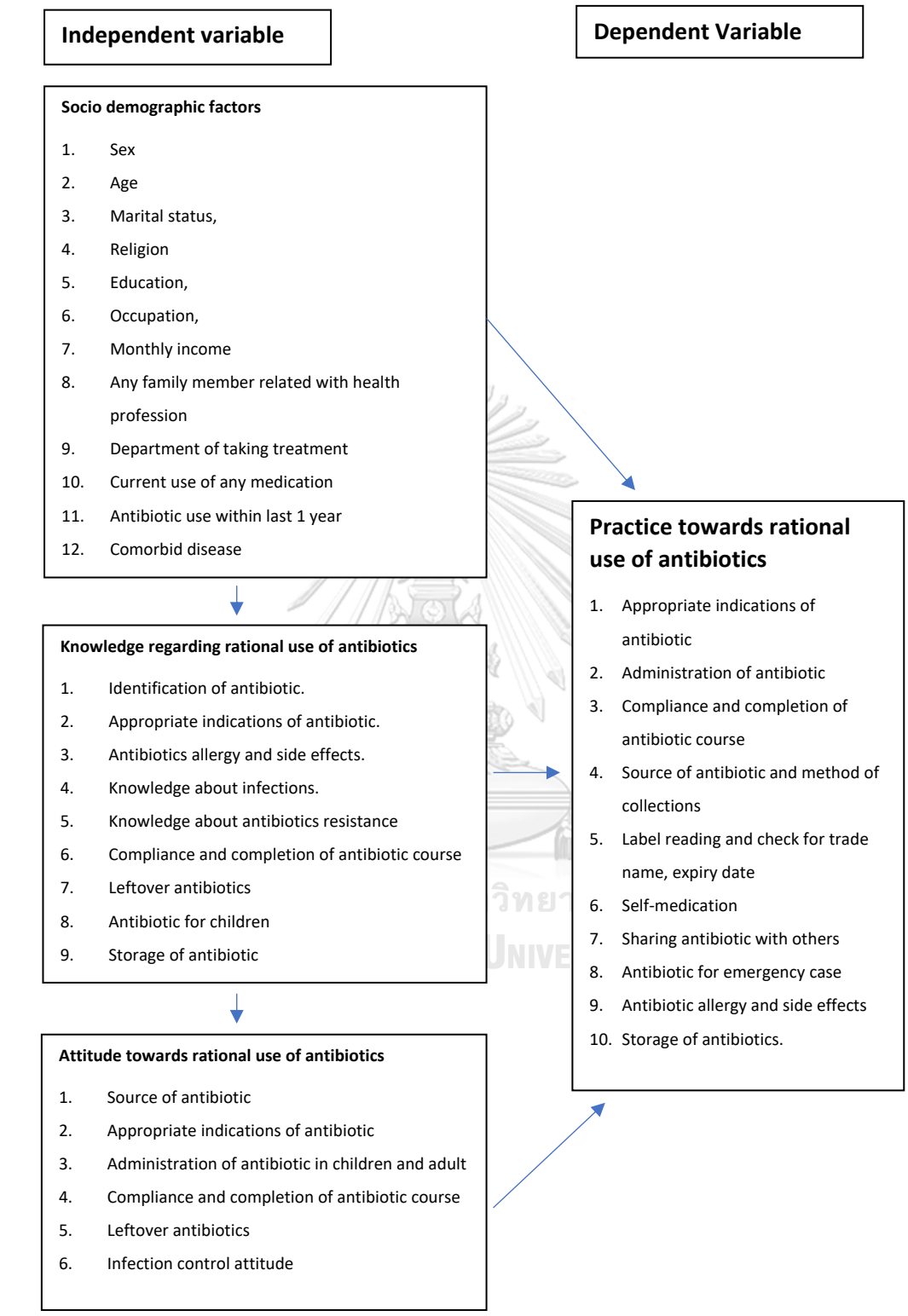

Figure 1 : Conceptual Framework

6 .OPERATIONAL DEFINITION

Sociodemographic factor: including sex , age, ,religion , marital status, education, occupation , monthly income, any family member related with health profession, department of taking treatment, use of antibiotic within last 1 year, current use of any other medication, co-morbid disease of the study participants.

Age- Age is refers to the age of study participants during data collection.

Sex- Refers to gender of study participants , male or female.

Religion -Refers to religion of study participants at the time of study. This is categorized in 5 groups. “Islam” “Hindu” “Buddhist” “Christian” “Others”.

Marital Status- Refers to whether individual legally married as per marriage laws or customs of the country. This is categorized in 4 groups, “Single” “Married” and “ Widowed” “Separated” / “Divorced”.

Education -Refers to the highest curriculum which study participants studied. This is categorized in 5 groups, “Below primary level” “Primary School” “Secondary school” “Higher secondary to Bachelor degree” “Master’s degree and above”.

Occupation- Refers to the occupation of the study participants do for the living. This is categorized in 5 groups , “Business” “Service” “Govt. officer” “Students” “Others”

Monthly Income-Refers to income of the study participants per months.

Family member related with health profession- Refers to any family member of the study participants are related with health profession.

Department of taking treatment- Refers to in which department participants taking treatment.

Antibiotic use within last 1year - Refers to study participants usage of antibiotics within last 1 year before participants in study.

Current use of any others medication- Refers to study participants usage of medications other than antibiotics.

Comorbid disease- Refers to the underlying disease of the study participants. This is categorized in 7 groups.

Antibiotic agents -are medicines that treat infections by killing bacteria. They don't work on viruses, like the flu.**(webMd)**

Antimicrobial agents -An antimicrobial is an agent that kills microorganisms or stops their growth. Antimicrobial medicines can be grouped according to the microorganisms they act primarily against. For example, antibiotics are used against bacteria and antifungals are used against fungi.**(Wikipedia)**

Antibiotic resistance (ABR) The ability of bacteria and other microorganisms to resist the effects of an antibiotic to which they were once sensitive. Antibiotic resistance is a major concern of overuse of antibiotics**. (www.medicinenet.com)**

Medical Tourist- Medical tourists are those who travel their own country to another country to seek better medical treatment. Medical tourists usually travel abroad for their better health and to improve quality of life. (https://en.wikipedia.org/wiki/Medical_tourism)

In this study, Bangladeshi patients are the medical tourists. Medical tourists are those who come with a medical visa, but this study will includes all Bangladeshi patients who come to seek treatment.

Knowledge about rational use of antibiotic -Knowledge means the fact or condition of knowing something with familiarity gained through experience or association. Knowledge about rational use of antibiotic means ability of study population to describe about antibiotic identification, indications , administration for children and adult , compliance and completion of antibiotic course, leftover antibiotics, antibiotic resistance, side effects and allergy, storage of antibiotics.

Attitude towards rational use of antibiotic - Attitude means a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation. Attitude towards rational use of antibiotic means tendency of study population to responds positively or negatively towards antibiotic identification, indication, administration for children and adult, side effects and allergy .

Practice regarding rational use of antibiotic - Practice means action rather than thought or ideas. Practice of rational use of antibiotic means use of antibiotic properly by study population in the context of identification , indication, administration of children and adult , side effects and allergy ,administration of antibiotic ,compliance and completion of antibiotic course ,leftover antibiotics ,label reading and check for trade name, expiry date, self-medication ,sharing antibiotic with others, antibiotic for emergency case, storage of antibiotics.

CHAPTER II

LITERATURE REVIEW

1.Mechanism of Antibiotic Resistance:

Antibiotic resistance is timeworn and expected result of the synergy of many organisms with their environment. Most antibiotic composition are naturally-produced molecules and coexistent bacteria have develop mechanisms to overcome their action in order to survive. Thus, these organisms are often considered to be "intrinsically" resistant to one or more antimicrobials. In clinical settings, we are typically referring to the expression of "acquired resistance" in a bacterial population that was originally sensitive to the antimicrobial compounds. The development of acquired resistance can be the result of mutations in chromosomal genes or due to the addition of external genetic determinants of resistance(Munita & Arias, 2016).

From developmental context, bacteria use two main genetic strategies to accustom to the antibiotic "invasion", i) mutations in gene(s) often associated with the mechanism of action of the compound, and ii) acquisition of foreign DNA coding for resistance determinants through horizontal gene transfer (HGT).Classically, bacteria bring in external genetic material through three main strategies, i) transformation (incorporation of naked DNA), ii) transduction (phage mediated) and, iii) conjugation (bacterial "sex")(Holmes et al., 2016; Munita & Arias, 2016).

2.Causes of AMR

Antimicrobial resistance occurs as a result of various factors including: lack of effective antimicrobials to treat infectious diseases, inappropriate use of antimicrobials in humans and animals, and improper infections control. This increasing resistance involves many common human pathogens, including Escherichia coli, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa, and other Enterobacter species . However, many of these bacteria and their method of resistance derived from the natural environment, including bacteria live in soils and water. Antibiotic resistance

development influence by environmental factor such as international travel , global trading , non-human antibiotic use, pharmaceutical waste, domestic and agricultural waste, poor sanitation and unsafe water supplies(Finley et al., 2013).

3. Development of new antibiotics

Antibiotics are major drugs to cure infections ,whether the infection in hospital settings or in community. Alexander Fleming , who discovered penicillin warned that bacteria could become resistant to these major drug, he mention this in his Noble prize speech in 1945.Though resistance development is natural process of microbes but this process amplified by improper use of antibacterial medicine. Last several decades this drug is misused in both human and food producing animals which helps to spread resistant bacteria. Until 1970s, many new antibacterial drugs were developed which was susceptible to antibiotic, but the last completely new classes of antibacterial drugs were discovered during the 1980s. After that no new antibiotic discovered. So it is necessary to preserve the efficacy of current drugs(WHO, 2014).

4.Antimicrobial use of animal and food Sector

Day by day antimicrobial use in both animals and humans are increasing, the extent of antimicrobial use and antibiotic resistance are becoming greatest concerns due to detection of increased resistance levels. In the year of 2014 it is found that in terms of antibiotic usage almost eighty two percent of antimicrobials were directed to food production animals,eighteen percent to humans and less than one percent to pet animals and crops. Seventy three of antimicrobials used to food production animals are same as human medicine (Ebrahim et al., 2016).

Now a days more antimicrobials are using in food production . In Europe study shows use of antimicrobials drugs in food producing animals varying a 100 times from 4mg to 400mg of antimicrobial in per kilogram of meat. Antimicrobial resistance exerted by antimicrobial use in veterinary medicine, food animal and fish production and agricultural use as well (Holmes et al., 2016).

5.Inappropriate use of antimicrobial in health sector

Antimicrobials are most common and widely used drugs for human but still 50 percent of all antimicrobials are unnecessary. Use , misuse, or overuse of antimicrobial drugs is responsible for antimicrobial resistance . The concentration of antibiotic prescribing is more in inpatient settings, with 30-40 percent patients receive antibiotics in European hospital (Holmes et al., 2016).

An study shows 45 percent children with RTI (respiratory tract infection) received penicillin and 83 percent received cephalosporin and 22 percent received aminoglycoside for pneumonia in hospital settings. A large proportion of antibiotics prescribed without following evidence based guidelines and inappropriate use of antibiotics for viral infection. This kind of antibiotics use leads to antibiotic resistance and poor outcomes for patients (Hogberg, Muller, Zorzet, Monnet, & Cars, 2014).

6.Self Medication

Self-medication is an important issue especially in developing countries. Universal access to health care is not achieved in developing countries. Self- medication is one of the common and preferred method by patients to obtain medicine. Various study found that self- medication may lead to delay in care seeking to hospital which may leads to delay of diagnosis of underlying cause and proper treatment. Indirectly self - medication related with economic loss due to delayed diagnosis. Also, self-medication can lead's to drug interaction, which can be prevented. Patient took care from licensed practitioner also taking medicine by self-prescription may lead to inactiveness of appropriate drugs. Self- medication practices considered useful sometimes. Drugs classified as "Over the counter" can be purchased without prescription and it might save money and time for patients. But practicing self-medication for drugs like antibiotics is very harmful and dangerous which might lead to antibiotic drug resistance(Selvaraj, Kumar, & Ramalingam, 2014).

Self-medication is a practice of treating any self- diagnosed disease or symptom in which patient treat himself by unprescribed drug or home remedies without consulting physician. It is a matter of argument that self-medication is patient's

independence to choose drug in minor illness in case of over the counter drugs. Practice of self-medication increasing due to increase in availability of drug, healthcare service becoming costlier and tendency to avoid physician. Sometimes people says that self-medication helps health care system by decreasing load on them and help patient to save money and time. On other side there are many studies found the ill effects of self-medication like adverse drug reactions, drug resistance, wrong diagnosis and wrong dosage. Self- medication may vary among different population and can be influenced by factors like age, gender, income, education, medical knowledge and patient's satisfaction perception. Self-medication, which is a common self- care practice around the world. It means obtaining or consuming drug without advice of health care personnel either for diagnosis, prescription or surveillance of treatment. Medicine for self- medication are often called non-prescription or over the counter drugs and can be purchased without physician prescription , from pharmacies or retail shops(Kulkarni et al., 2018).

The consumption of self- prescribed medicine or over the counter (OTC) drugs has been studied in many different population and results shows that 25-75% of the people consume over the counter drugs. A study in Malaysia found that 75% of the participants had used OTC drugs at least once. Most commonly used medicine are analgesics, antibiotics, antipyretics, cough medicine and supplements. Time saving has been one of the significant benefits to self -medication because these drugs are available in pharmacies, supermarkets and retails shops, also does not require physician appointment or prescription to buy. However , lack of knowledge of the drug dosage and frequency of intake may lead to adverse drug reaction, organ damage, development of drug resistance. This may leading delayed diagnosis and prolong treatment or ineffective treatment(Mohamed Irfadh Mohamed Azhar 1, 2013).

Self- medication with antibiotics is one of the important contributors to antibiotic resistance in worldwide. In many countries antibiotics are available to purchase without prescription. The risk of self- medication with antibiotics may be significantly increased antibiotics resistance when it is available without medical consultation or

prescription. Antibiotic resistance is an international public health problem. The usage of antibiotics is associated with antibiotic resistance. Incorrect dosage ,frequency, suboptimal dosage are related with antibiotic resistance(J Hu, 2014).

7.Drug policy of Bangladesh

The Ministry of Health and Family Welfare(MoHFW) of the Government of the Peoples Republic of Bangladesh establish the "Directorate of Drug Administration (DDA)"to act as a national regulatory authority in1976. DDA upgrated in January 2010 and became Directorate General of Drug Administration (DGDA).DGDA is responsible for maintaining safety, efficacy and quality of pharmaceutical products through implementation of legislation. In 1982 government introduced "National drug policy 1982 " gave prority to production of essential drugs, removed all harmful ,undesirable products. In 2001 MoHFW constituted a "National Drug review committee" to review NDP 1982.In 2005 there is another updated drug policy "National Drug policy 2005". The NDP 2005 included the policy area such as law and regulations relating to drugs, the mandate for Drug Regulation Authority(DRA), rules and procedures and criteria related to drug registration and drug production, drug procurement, drug distribution, sales and storage, drug pricing, quality assurance of drugs and pharmaceuticals, technical manpower in the manufacturing unite , dug information and monitoring , and essential drug. The MoHFW formulated the national drug policy 2016 to ensure that the people can have easy access to safe effective and good quality drugs, to ensure rational and safe use of drugs and proper dispensing, to achieve self-sufficiency in the manufacture of drugs and raw materials, to establish effective surveillance system of medicine. This national drug policy 2016 articulates well defined directives fo drug safety, efficacy, rational use, effective drug control management production , marketing, distribution, storage and import-export. In Bangladesh there is shortage of official published information on medicine use in hospitals . Also there is poly pharmacy, high vitamin use, high use of antibiotics and low prescribing of generic named drugs to be purchased in the private pharmacies. Moreover there is no comprehensive national treatment guideline.

Bangladesh is a country with a very large pharmaceuticals sector , there is more than 852 allopathic and alternative medicine manufacturers with 1,23,542 registered retail shops and 26,910 allopathic branded products in market. But in Bangladesh there is extreme manpower shortage in pharmaceuticals sector. Adequate inspection and supervision is not possible due to lack of manpower. Moreover pharmacist is not available in pharmacy shops to dispensing drugs. The pharmaceuticals of Bangladesh develop and produce almost all kind of medicines including antibiotics , insulin , hormones , anticancer drugs and other essential medicine as well. In Bangladesh, medicine and medical devices are directly sold to patients in retail pharmacies. Retail sales of drugs in Bangladesh are allowed only under the direct supervision of a registered pharmacist by Pharmacy council of Bangladesh. While many drugs are dispensed to be only with prescription by law. But in reality medicine like antibiotics are available without prescription(Govt., 2016) .

8.Review about study area

Bangkok General Hospital opened in 1972 by a team of physicians, pharmacists and 30 nurses, is now one of the biggest private hospitals of Southeast Asia. The original hospital became the Bangkok Hospital Group, now Thailand's largest hospital operator with 46 hospitals in major cities throughout Thailand and some other countries of South Asia. This hospital located in soi-soonvijai , new petchburi road ,Bangkok ,Thailand. This is a tertiary level private hospital having all kind of treatment facilities. It has some center of excellence such as medicine, heart , cancer, bones, brain, trauma center, dental etc. In this hospital more than 1200 specialized physician works and every year more than 1349770 people contacting for treatment purpose. They have IMS as a department especially for foreigners BMS for Bangladeshi patients and help desk for other nationality as well. IMS also has its own International Clinics, where nurses and doctors serve patients from all over the world. An study shows 63,000 patients went to Thailand in 2015 and day by day number is increasing. Other than Bangkok General Hospital, a number of Bangladeshis chose Bumrungrad International Hospital and Samitivej Hospital among

other medical centers in Thailand. Around 50 to 60 patients visited in different department of Bangkok General Hospital for consultation and treatment. Mostly visited departments are cancer, neuro, heart, orthopedic diseases, general medicine, surgery, GI and liver center, gynecology etc.("International Medical Services," ; Monitor, 2018; Tribune, 2017).

9. Review about Bangladeshi tourist in Bangkok

Study about medical tourism in Thailand shows 104 830 medical tourists who each visited one of the five surveyed hospitals in 2010. These tourists accounted for 44.3% of the 236 885 foreign patients identified in the hospital records and for 324 906 (35.6%) of the 911 913 attendances by foreigners. The medical tourists were less likely to be residents of high-income countries in North America or Australasia than to be residents of the eastern Mediterranean or south-east or south Asia . The highest numbers of medical tourists in Thailand in 2010 came from the United Arab Emirates (21 568), followed by Bangladesh (8443), the USA (7855) and Myanmar (7568)(Noree, Hanefeld, & Smith, 2016).

10.Concepts on knowledge , attitude and practice (KAP) Study and its use:

A KAP survey is a representative study of a specific group of population or a specific community to collect information about their knowledge , believed and their action in relation to a particular topic.

KAP surveys can also find out knowledge gaps, cultural beliefs, or behavioral patterns that may change people understanding and action, as well as pose problems or create barriers in individual level or in community level . KAP survey helps to identify information that is commonly known and attitudes that are commonly held. KAP survey can also identify behavior influencing factors which are not known to most people, reasons for their attitudes, and how and why people practice certain health behaviors.

KAP surveys can also assess communication processes and sources that are key to defining effective activities and messages for prevention and control of specific problem or diseases. KAP surveys may be used to identify needs, problems and barriers in program delivery, as well as solutions for improving quality and accessibility of services(WHO, 2008).

“KAP” study measures the Knowledge, Attitude and Practices of a community or group of people. It serves as an educational diagnosis of the community. The main purpose of this KAP study is to explore changes in Knowledge, Attitude and Practices of the community, paramedical personnel and medical practitioners. KAP Study tells us what people knowledge about certain things, how they feel and also how they behave. The three topics that a KAP study measures are Knowledge, Attitude and Practice. The “Knowledge” possessed by a community refers to their understanding of any given topic. “Attitude” refers to their feelings towards the given topic, as well as any preconceived ideas that they may have towards it. “Practice” refers to the ways in which they demonstrate their knowledge and attitude through their actions. Understanding the levels of Knowledge, Attitude and Practice will enable a more efficient process of awareness creation as it will allow the program to be tailored more appropriately to the needs of the community(Kaliyaperumal, 2004).

The sample size for KAP study should be large enough to represent the population but should not be so large that the data collection and analysis is too difficult. When assessing the KAP of a community, division of the population into subcategories is typically desirable because different educational, cultural, and socioeconomic backgrounds and therefor will likely have different levels of KAP.

After the data collection, the data will be analyzed to determine the KAP level of the community . Once the analysis is complete , it should be presented in a report(Kaliyaperumal, 2004).

To guide survey design and data collection, researcher needs practical tools and guidelines. According to WHO(WHO, 2008) The practical guidance for conducting a KAP survey by following a six-step process as follows **:**

Step 1: Define the survey objectives contains information about how to access existing information, determine the purpose of the survey and main areas of enquiry, and identify the survey population and sampling plan.

Step 2: Develop the survey protocol outlines elements to include in the survey protocol and suggestions to help identify the key research questions. Determining whether the survey needs ethical review is critical to this step, as well as creating a workplan and budget.

Step 3: Design the survey questionnaire proposes important steps for developing, pre-testing and finalizing the questionnaire, and for making a data analysis plan.

Step 4: Implement the KAP survey includes considerations for choosing survey dates, recruiting and training survey supervisors and interviewers, and managing survey implementation.

Step 5: Analyze the data consists of entering and checking the quality of the survey data, and implementing the data analysis plan created in Step 3.

Step 6: Use the data highlights ideas on how to translate the survey findings into action, elements to include in the study report, and how to disseminate the survey findings.

11.Related KAP Research findings:

A KAP study regarding antibiotic use and resistance done among Palestenians adults by Abu Taha et al. 2016. Study shows 55percent of the study population had a good knowledge and 56.5percent participants had a good attitude towards antibiotic use. Study also found significant correlation between knowledge and attitude towards antibiotic use. High family income and high education level has good attitude towards antibiotic use. This study also found there is a gap between knowledge and attitude in antibiotics use among the participants (Abu Taha et al., 2016).

Al shibani et al. 2017 conducted KAP study towards antibiotic use and misuse among adult population in Riyadh , Saudi Arabia. In this study population was 1966, among them 67 percent of participants does not know the meaning of antibiotic resistance,

64.9 percent does not know about allergy and side effects. 24 percent participants believe that antibiotics use for the treatment of viruses. Half of the participants 51 percent used antibiotics without physician prescription and 37.5 percent collect antibiotics directly from pharmacist. Nearly half of the participants (42percent) stopped antibiotics if their symptoms improved**.** There was significant difference in knowledge response of antibiotics resistance and source of antibiotics use , reason of AB use and discontinuation of antibiotics(Al-Shibani et al., 2017).

Similar study in China regarding antibiotic use done by Gu et al.2015 between urban and rural people. Result shows urban people have better knowledge and attitude towards antibiotics use than rural people. Majority of participants (>60percent) were aware about antibiotic use and antibiotics resistance (Gu et al., 2015).

A study in South Korea was done by Kim, Moon and Kim, 2011 to know public knowledge and attitude towards antibiotic use found that general people has misconception and inadequate knowledge about antibiotics , its uses and resistance. Though study shows most of the participants has correct knowledge to common cold and coughs. But generally people does not have adequate knowledge for appropriate use of antibiotics , antibiotic resistance and spread of antibiotic resistance bacteria(Kim, Moon, & Kim, 2011).

Another study done in Penang Malaysia by Ling Oh et al., regarding knowledge attitude towards antibiotics use found 55percent of the participants had a moderate level of knowledge. 76.7% of participants response that antibiotics are used for bacterial infections. But 67.2 percent believed that antibiotics also can use for the treatment of viral infections. However more than half of the participants(59.1percent) believed that antibiotic resistance has relation with overuse of antibiotics. Regarding attitude same study shows that 38percent participants believed antibiotics helped them for faster recovery from common cold symptoms. Sociodemographic factors such as age race, educational level has significant association with knowledge and attitude towards antibiotics use (Ling Oh et al., 2011).

A very recent study in Qatar shows antibiotics are expected medicine by 28.1% participants when they go to see physician. This study also showed that 49.6percent participants were dissatisfied with the physician not to prescribing any treatment and 31.6percent of them asked for antibiotics(Shaikhan, Rawaf, Majeed, & Hassounah, 2018).

A survey in Poland regarding public knowledge and attitudes towards antibiotics use shows 38percent of polish adult use antibiotics within last 12months. Majority 90percent of antibiotics prescribed by physicians. Only 3% participants obtained antibiotics without prescription. The most common reason for taking antibiotics common cold, sore throat, cough and flu. Forty percent of the participants are commonly expected antibiotics for flu. Majority 80 percent of participants knew that antibiotics kills bacteria , meanwhile 60% believed antibiotics can killed viruses also(Mazinska, Struzycka, & Hryniewicz, 2017).

A study in Sweden regarding peoples knowledge towards antibiotic use and antibiotic resistance shows Swedish population has very good knowledge that 94 percent of the participants aware about resistance of bacteria towards antibiotics. Majority of participants answered correctly regarding resistance development. Peoples also expressed their trust in physician who decided not to prescribe antibiotics. Men ,young and educated participants had more knowledge and high level of knowledge related with appropriate attitudes to antibiotics(Vallin et al., 2016).

Similar study in Italy shows only 9.8percent participants knew definition of antibiotic resistance and 21.2% knew proper indication of antibiotics. This study also shows participants with higher education , family member working in health care sector have better knowledge towards antibiotic use and antibiotic resistance. One third of participants (32.7%) use self- medications and 22.7percent willing to take antibiotics without physician prescription.(Napolitano, Izzo, Di Giuseppe, & Angelillo, 2013).

A comparative European study was done by Grigoryan et al. 2007 regarding peoples attitude, beliefs and knowledge concerning antibiotic use , antibiotic resistance and self- medications. Participants from southern and eastern countries had less

appropriate attitudes, beliefs or knowledge in compared with Swedish participants at least for one of the dimensions. Participants from northern and western countries had same knowledge level as Swedish peoples. But British participants had more positive attitudes towards self-medication with antibiotics for upper respiratory infection. A big percentage of participants (72 percent) who were well before wanted antibiotics for respiratory infection from their general practitioner. Country which has high prevalence of resistance has lowest awareness about antibiotic resistance (Grigoryan et al., 2007).

A survey in Bangladesh was done to find the reason behind the misuse of antibiotics shows majority of participants (70percent) are not concern about antibiotic resistance and its after effect due to lack of adequate knowledge. Only 18percent participants knew the term antibiotic resistance but do not have adequate knowledge. Twelve percent participants has proper knowledge about antibiotic use and resistance. Majority of participants use antibiotics without physician prescription for fever, pain or flu like symptom without considering the dosage completion (Uddin et al., 2017).

Recently another KAP study done in Bangladesh among patients attending OPD of a dental college hospital in Dhaka city regarding antibiotic usage shows 86.1percent people knew that inappropriate use of antibiotics can causes harm to the body while majority , almost 97.5percent have never heard of the term antibiotic resistance. This study shows people with higher income group and higher education has significant relation towards KAP on antibiotic usage .This study also found that people do not take antibiotic once they feel better(Yasmin, Gyeltshen, & Islam, 2018).

Similar KAP study done among the students of microbiology department of a university in Bangladesh regarding antibiotic use shows 23.7percent participants think that antibiotics are useful for viral infection, 48.9percent stated that antibiotics can help for faster recovery of common cold , cough. Study found students has a good attitude towards antibiotic resistance. But students practices regarding proper antibiotic use is poor . More than Fifty percent's of students took antibiotic last year and 75.5% took antibiotics through physician advice. One third of the participants took

antibiotic for fever and 31.6 percent took antibiotics without physical examination(Mukharjee, Mahmud, Akter, & Hossain, 2017).

A study done among physician and patients regarding irrational use of antibiotics and antibiotics resistance in southern rural Bangladesh found that Physician prescribe antibiotics in suspicion of infections. Forty four percent physician prescribe antibiotics for cold and fever before confirmed diagnosis. Physician thinks that patients non-compliance is the main cause of antibiotic resistance in the country. Although 48.6% think that it is important to follow physician advice. More than fifty percent patient stop taking antibiotics when they feel better. Only 25.2 percent patient complete their antibiotic course(Kumar Bishwajit Sutradhar1, 2014).

12.Strategies to Combat Antibiotic Resistance

The “Global action plan on antimicrobial resistance” has 5 strategic objectives:

To improve awareness and understanding of antimicrobial resistance.

To strengthen surveillance and research.

To reduce the incidence of infection.

To optimize the use of antimicrobial medicines.

To ensure sustainable investment in countering antimicrobial resistance.

A political declaration endorsed by Heads of State at the United Nations General Assembly in New York in September 2016 signaled the world’s commitment to taking a broad, coordinated approach to address the root causes of antimicrobial resistance across multiple sectors, especially human health, animal health and agriculture. WHO is supporting Member States to develop national action plans on antimicrobial resistance, based on the global action plan(WHO, 2018a).

World Antibiotic Awareness Week Held every November since 2015 with the theme “Antibiotics: Handle with care”, the global, multi-year campaign has increasing volume of activities during the week of the campaign(WHO, 2018a).

CHAPTER III

RESEARCH METHODOLOGY

3.1 Study design

A cross-sectional descriptive research design was used to assess the level of knowledge, attitude and practices regarding rational use of antibiotics among Bangladeshi Medical tourists in Bangkok ,Thailand.

3.2 Study area

Study carried out in renowned private hospital in Bangkok, Thailand. This hospital located in soi soonvijai , new petchburi road ,Bangkok ,Thailand. This is a tertiary level private hospital having all kind of treatment facilities.

Figure 2: Map of study area

3.3 Study population

The study targeted on Bangladeshi medical tourist who visited private hospital in Bangkok, aged more than 18 years to 75 years old both male and female able to provide responses in questionnaire form. Researcher purposively selected the Bangkok General Hospital as study because this is one of the largest private hospital in Bangkok and one of the popular among Bangladeshi Medical tourist (Ali & Medhekar, 2018).

3.4 Sample size

Applying the formula of Cochran sample size calculation:

$$n = \frac{z^2 \times p \times (1-p)}{d^2}$$

$$n = \frac{1.96^2 \times 0.38 \times (1-0.38)}{0.05^2} = 362$$

n: Sample size

z: Value from normal distribution associated with 95% confidence interval 1.96

p: The estimated proportion of an attribute that is present in the population. According to previous study conducted in OPD of a dental college in Dhaka, Bangladesh, good antibiotic usage practice score is 38% of total sample population(Yasmin et al., 2018).

d: Error allowance (degree of accuracy desired) 5%

This study used 5% of non-completion of questionnaire

So total sample size can be calculated from this formula, 362+18=380

3.5 Inclusion and exclusion criteria

Participants was included in the study need the prerequisites as follows:

Inclusion Criteria:

1.Bangladeshi Nationality, traveling to Thailand for medical treatment purpose.

2. Adult patients above 18 years of age to max of 75 years of age both male and female and able to provide responses in the questionnaire form.

3. Taking treatment as OPD case.

4.Agree to participate in the study with informed written consent

5. People who completed Higher secondary and higher.

Participation was voluntary and anonymous, and the questionnaire was designed based on previously published questionnaire.

Exclusion Criteria:

Participants who satisfy the inclusion criteria but cannot respond the study questionnaire because of:

1. People who are critically ill, e.g. can not response due to respiratory problem.

2. People who are incapable of responding to questionnaire due to mental health problem.

3. Conflict language, not understand the questionnaire in English.

4. People who are medical professional-Physician.

5.People who are not willing to participate in study.

6. People who are expat.

Duration of the study

Study was conducted May, 2019

3.6 Sampling technique

Sampling method was convenience sampling technique. Research assistance checked the appointment list of the Bangladeshi nationality every morning, population who met the criteria was asked to participate in study. Sample was selected based on characteristics of the population and objective of the study. Research data collection continued until target number of population achieved.

3.7 Research Instruments

Method: In this study self administered structured questionnaire was used for data collection.

Tool: A self administered structured questionnaire, was designed based on previously published questionnaire.The questionnaire was developed with the help of literature review and studies regarding antibiotics in worldwide and studies in Thailand(Abu Taha et al., 2016; Al-Shibani et al., 2017; Gu et al., 2015; Kanjanachaya Sirijoti1, 2014; Kim et al., 2011; Vallin et al., 2016).The questionnaire items are modified .

The questionnaire was divided into 4 part(Kanjanachaya Sirijoti1, 2014).

1.Sociodemographic factors.

2.Knowledge about rational use of antibiotics.

3.Attitude towards rational use of antibiotics.

4.Practice regarding rational use of antibiotics.

Sociodemographic factors- This section of questionnaires contains 12 questions regarding general information of study participants such as sex , age, religion, marital status, education , occupation, monthly income, family member related to health education, department of taking treatment, antibiotic use within last 1 year, current use of any other medications, comorbid disease.

Knowledge about rational use of antibiotics – This second part of questionnaire was knowledge part regarding rational use of antibiotics which was composed of 21 questions such as:

1. Identification of antibiotics (item 1-3),

2.Appropriate indications of antibiotic(item 4-7),

3.Antibiotics allergy and side effects (item 8-9),

4.Knowledge about infections(item 10-12),

5.Knowledge about antibiotics resistance (item 13-17),

6.Compliance and completion of antibiotic course(item 18),

7.Leftover antibiotics(item 19),

8.Antibiotic for children (item 20),

9.Storage of antibiotic (item 21)

Attitude towards rational use of antibiotics - This third part of questionnaire was attitude part regarding rational use of antibiotics which was composed of 22 questions such as: 1.Source of antibiotics (Item 1-6,21),

2. Leftover antibiotics(item 11-13,20),

3. Indication of antibiotics (item 7-9,16-19)

4.Infection control attitude(item 14-15),

5.Compliance and completion of antibiotic course(item 10)

6.Administration of pediatrics antibiotic (item 22)

Practice regarding rational use of antibiotics – This fourth part of questionnaire was practice part regarding rational use of antibiotics which was composed of 29 questions such as:

1.Appropriate indications of antibiotic(item 1,3) ,

2.Administration of antibiotic in children and adult (item 21-25) ,

3.Compliance and completion of antibiotic course (item 9,12,14),

4.Source of antibiotic and method to collection (item 2,6, 15-17)

5.Label reading and check for trade name, expiry date (item 18-20),

6.Self-medication (item 4,5,7,11,13),

7.Sharing antibiotic with others (item 8),

8.Antibiotic for emergency case (item 10),

9.Antibiotic allergy and side effects (item 26),

10.Storage of antibiotics (item 27-29).

3.8 Scoring and its classification

Scoring of the questionnaires was done to identify the variables for measurement

Knowledge about rational use of antibiotics

The test for knowledge about rational use of antibiotics carried 21 questions. For this section, when the respondent answered correct knowledge about rational use of antibiotics , 1 score was given. On the other hand, if the answer was incorrect or do not know, 0 score was given. Knowledge score can be 0 to 21. Maximize obtainable score for this part was 21 points. The obtain knowledge score was expressed as mean +/- , standard deviation and percentage.

Bloom's cut off point was used for classification of knowledge score.

If respondent answer more than 80% correctly it was considered "Good knowledge",

If respondent answer 60% to 80% correctly it was considered "Moderate knowledge"

If respondent answer less than 60% correctly it was considered "Poor knowledge".

Attitude towards rational use of antibiotics

The test for attitude towards rational use of antibiotics carried 22 questions. For this section 5 points Likert scale was used and scoring criteria was like following . The respondent can answer five options, strongly agree, agree, not sure, disagree and strongly disagree.

For positive attitude, score given was "Strongly agree" 5 score

"Agree" 4 score

"Neutral" 3 score

"Disagree" 2 score

"Strongly Disagree" 1 score

For negative attitude, reverse scoring was given "Strongly agree" 1 score

"Agree" 2 score

"Neutral" 3 score

"Disagree" 4 score

"Strongly Disagree" 5 score

Therefore, attitude score was 22 to 110.

Attitude score was categorized into three attitude level using the mean score of respondents and standard deviation.

"Good or high attitude" was categorized by score more than to mean plus standard deviation. "Moderate attitude" was categorized by score between mean plus standard deviation and mean minus standard deviation.

"Poor attitude" was categorized by less than mean minus standard deviation.

Practice regarding rational use of antibiotics:

The test for practice towards rational use of antibiotics carried 29 questions. For this section answer had 3 levels: "Usually" means respondents practice more than half of their time. "Sometimes" means respondent practice one third to half of their times. "Never" means respondent practice less than one third of their times.

For scoring, if the respondent answer usually, 3 score was given. If the respondent answer sometime, 2 score was given. If the respondent answer never , 1 score was given. For incorrect practice reverse scoring was given. Total practice question was 29 . So, practice score was 29 to 87.

Practice score was categorized into three level using the mean score of respondents and standard deviation.

"Good or high practices" was categorized by score more than to mean plus standard deviation. "Moderate practice" level was categorized by score between mean plus standard deviation and mean minus standard deviation.

"Poor practice" level was categorized by less than mean minus standard deviation.

3.9 Validity and Reliability of questionnaire

Questionnaire items were internally reviewed by three experts in College of Public Health Sciences, Chulalongkorn University for content and construct validity of the questionnaire before use. Research proposal and questionnaire were sent to three experts from exam committee to read and review for content validity. All experts were read and gave feedback. For each question score was +1/0/-1. The Index of Item-Objectives Congruence (IOC) was conducted. After validating the questionnaires IOC scores by three experts was summed up and divided by three. Average IOC was 0.96 . The score which was equal or less than 0.5 that questions adjusted accordingly.

3.10 Pre-test and reliability

The pre-test was organized before two weeks of the first day of data collection. The sample of the pre-test is 30 Bangladeshi medical tourists that has similar inclusion criteria as the study sample. Study area was a private hospital in Bangkok, The pretest was done by researcher and participants from pretest were not include in the study.

The objectives of the test were to determine the response of participants to the questionnaire, validity and reliability of study instrument and the appropriateness for the flow of the questionnaire , duration of time and to check internal consistency of the questionnaires.

Cronbach's Alpha was used to test the internal consistency of perceptions and in SPSS software. Cronbach's Alpha level with above cutoff point of 0.70. For internal consistency of knowledge, Kuder-Richardson formula 20, or KR-20 with cutoff points of 0.7 was calculated in SPSS software. The results from KR 20 showed 0.88 for 21 knowledge questions and from Cronbach's alpha showed 0.86 for 22 attitude questions and 0.79 for 29 practice questions for the pretest. The questionnaire was revised following results of the content validity and pre-test, the responses and suggestions from test takers.

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3.11 Data collection

Data was collected by self-administered structured questionnaire by study participants. Before data collection researcher trained two research assistant about data collection steps and discussion about the research objectives, questionnaire and process of data collection method , detailed information about questionnaire and ethics about conducting research. Research assistant had qualifications such as ability to read, speak and write Bangla and English language, know the study area, understanding of the research in general and its objectives and had previous experience of working as a research assistant. Researcher explained all the topics to research assistance with related document. Research assistant asked questions to principal researcher if they wanted to know more.

After getting permission from respected authority data collection was begun, the list of participants was selected according to daily appointment list. Principal researcher and research assistant had go to out-patient department with the help of hospital staff. People who meets inclusion criteria were requested to participate in study. The researcher had to explain about the purpose of the study, their right to choose about participation, right to withdraw, and confidentiality, as well as that data, would not be used for other purposes using the consent form and participant information sheet. Then, the researcher took both oral and written consent with a signature from participants if the participants wanted to participate. If a selected participants refuse to participate he was excluded from study.

Principal researcher and trained assistant distributed the questionnaire to the study participants with an envelope and asked them to fill all the necessary information and answer all the questions in papers by themselves and check for completeness before return back to principal researcher or research assistants in close envelope. Researcher and assistant requested participant to use private room or appropriate place to complete questionnaire. Researcher and assistant helped study participants if they had any problem to understand the questionnaire. Researcher and assistant

checked for completeness of the answer and compiled answered questionnaire. The process of data collection was continued until target number of participants achieved. The completed questionnaire was coded , cleaned for missing data and entered for analysis accordingly.

3.12 Data analysis

Researcher checked the answered questionnaire and data cleaning was performed before analysis. The licensed SPSS software version 22 was used for analysis and clearance. After collection of data, a questionnaire was coded before entering into the SPSS version 22.

a.Descriptive Statistics

Descriptive Statistics i.e. frequency, percentage, mean, standard deviation, range and normality test was used for analyzing the general characteristics of the respondents and knowledge, attitude and practice about rational use of antibiotics.

b. Inferential Statistics

Bivariate analysis- in order to determine the relationship between dependent and independent variable bivariate analysis was used.

Chi-square test was used to determine the association between socio demographic factors , knowledge and attitude (independent variable) and practices (dependent variables) at 0.05 significant level.

Fisher's exact test was used if cell frequencies are less than 5 in more than 20 percent of cells to determine association between dependent and independent variables.

After doing normality test data was not normality distributed. Shapiro-wilk test was used to identify normality (significant value was <0.001).

Non-parametric test Spearman's correlation test was used as a test to find correlation between knowledge , attitude and practices regarding rational use of antibiotics .Since Spearman Correlation can predict direction and magnitude of the study variance. Therefore it could be used as conjunction with Chi-square statistics.

3.13 Ethical consideration

For the ethical consideration, the research proposal and questionnaire was submitted to the Chulalongkorn University Research Ethics Review Committee. Necessary changes were carried out as per the feedback from the committee board before moving ahead for data collection. After getting approval from the committee the thesis has been proceeded according to guideline of Chulalongkorn University. Participation of the respondents was voluntary, decision of the respondents were not disclose to any authority. This study was an observational study with absolutely no intervention on the research subjects. All study participants were provided adequate study information before decision of participation in the study. They had authority to discontinue from the study whenever they want. Each participant had informed consent form to sign prior to their participation in the study. All data collected from each individual was kept private and confidential. The collected data were put in database and then all the answer sheets will be destroyed after report writing. Ethical approval by Research Ethics Review Committee for Research involving Human Research Participants , Health Sciences Group, Chulalongkorn University by COA No. 132/2019.

3.14 Limitation and solution

The study results only describe the level of knowledge, attitude and practice towards rational use of antibiotic use among Bangladeshi medical tourist in Bangkok , Thailand. This result may be similar to other study.

The result of this study was limit to the high socio-economic status of Bangladeshi medical tourists, who seek the better medical management for their health problems in Thailand. It was not able to extrapolate KAP towards rational use of antibiotics to all Bangladeshi citizen.

The data was collected from medical tourists and sampling was convenience sampling technique so there may have selection bias.

The results may not be indicative to entire population. Moreover, this people come from different part of Bangladesh to receive treatment so there might be bias.

The study was a cross sectional study with a self- administered questionnaire, so there might be recall bias.

3.15 Obstacles and Strategies to solve the problems

a.Before collecting data should train research assistance team carefully to unify the research objectives, interview, record forms and statistical methods. The research assistance team checked answer sheets each day before handing over them. Incomplete information should be collected properly by team.

b.To conduct compliance sampling technique with inclusion and exclusion criterias.

c.To integrated observation during pre-test.

d.To entry data 2 times with different input workers to avoid biases.

3.16 Expected Benefits

The result of this study identified the level of knowledge , attitude and practice towards rational use of antibiotics among Bangladeshi medical tourists in Bangkok Thailand. Result also help to find how medical tourists use their medicine specially antibiotic , rationally or not.

The issue of rational use of antibiotics have been seriously considered worldwide and appropriate solution should be developed . It is very important to know the level of knowledge, attitude and practices in people who use antibiotics. The result of the study will describe current situation of knowledge, attitude and practices regarding rational use of antibiotics among Bangladeshi medical tourists in Bangkok,Thailand.

Expectantly, the study findings can be used for promotion health policy makers to design the intervention programs in order to increase awareness of people on rational use of antibiotics. Besides, the study can be a suggestion for other scientists to research more deeply in this field.

CHAPTER IV
RESULT

A cross sectional descriptive research design was used to assess the level of knowledge attitude and practices regarding rational use of antibiotics among Bangladeshi medical tourists who visited in different department of private hospital Bangkok, Thailand. Total participants were 362 and response rate were 100%.

This chapter will describe findings of data analysis. Data analysis and result of survey will describe in following order:

1. Socio-demographic factors of study participants

2. Level of knowledge , attitude and practice towards rational use of antibiotics.

3.Association between sociodemographic factors and level of knowledge, attitude and practices towards rational use of antibiotics.

4.Association between knowledge level and attitude level towards rational use of antibiotics.

5. Association between attitude level and practice level towards rational use of antibiotics.

6. Association between knowledge level and practice level towards rational use of antibiotics.

4.1: Socio-demographic factors of study participants

Sociodemographic factor of study participants : including sex , age, ,religion , marital status, education, occupation , monthly income, any family member related with health profession, department of taking treatment, use of antibiotic within last 1 year, current use of any other medication, co-morbid disease of the study participants.

Table 1: Socio-demographic factors of study participants (n-362)

Socio-demographic factors	Number(n)	Percentage(%)
SEX		
Male	204	56.4
Female	158	43.6
Age (years)		
18-32	84	23.2
33-47	165	45.6
48-62	76	21.0
63-75	37	10.2
Religion		
Islam	294	81.2
Hindu	34	9.4
Others (Buddhist, Christian)	34	9.4
Marital Status		
Single	58	16.0
Married	255	70.4
Widowed/separated/divorce	49	13.5
Education		
Higher secondary	15	4.1
Bachelor degree	173	47.8
Masters degree and above	174	48.1
Occupation		
Business	142	39.2
Service	105	29.0
Govt. officer	29	8.0
Students	38	10.5
Other	48	13.3

Monthly Income(USD)		
1000-4900	306	84.5
5000-10000	56	15.5
Family member in health		
Yes	44	12.2
No	318	87.8
Department		
Medicine	82	22.7
Surgery	38	10.5
Gynecology	35	9.7
GI and Liver	31	8.6
Neurology	33	9.1
Oncology	27	7.5
Cardiology	30	8.3
Urology	23	6.4
Orthopedics	34	9.4
Dermatology	29	8.0
Antibiotic use within 1year		
Yes	210	58.0
No	152	42.0
Any other medication		
Yes	200	55.2
No	162	44.8
Comorbid disease		
Yes	258	71.3

No	104	28.7

Following table -1 ,regarding sex study participants comprises of male 56.4% (204 subjects)

Female 43.6%(158 subjects).

Regarding age the majority of the respondents 45.6% are in age group 33-47years followed by 23.2% are in age group 18-32 years old, 21.0% are in age group 48-62 years old and 10.2% in 63-75 years old .

Regarding religion, the majority of the participants 81.2% believe in Islam followed by 9.4% Hindu and 9.4% Buddhist and Christian.

Regarding marital status , majority of the participants 70.4% are married , 16% are single and 13.5% are widowed/separated/divorced.

Regarding education majority 48.1% of the participants has master's degree and above, 47.8% has bachelor degree and 4.1% has higher secondary.

Regarding occupation majority of the respondents 39.2% are doing business followed by 29% in service, 10.5% student , 8% in govt. service,13.3% in others group includes housewife, lawyer , teacher.

Regarding monthly income majority of the participants 84.5% are in 1000-4900USD group and 15.5% in 5000-10000USD group.

Regarding family member related with health profession majority of the participants 87.8% replied "No" and 12.2% replied "Yes".

Regarding department of taking treatment majority 22.7% of the participants are taking treatment in medicine followed by 10.5% in surgery, 9.7% in gynecology,9.4% in orthopedics, 9.1% in neurology, 8.6% in GI and Liver, 8.3% in cardiology , 8% in dermatology,7.5% in oncology, 6.4% in urology respectively.

Regarding antibiotic use within last 1 year majority 58% participants replied "Yes" and 42% replied "No"

Regarding current use of any other medication majority 55.2% of the respondents replied "Yes" and 44.8% replied "No"

Regarding comorbid disease majority 71.3% has comorbid disease while 28.7% has no disease.

Table 2:Comorbid disease of the participants (n-362)

Co-morbid disease	Number(n)	Percentage(%)
Diabetes mellitus	60	16.6
Peptic Ulcer	40	11.0
Hypertension	56	15.5
Dyslipidemia	50	13.8
Asthma	21	5.8
Chronic kidney disease	16	4.4
Allergy	3	0.8
Anemia	7	1.9
Headache	5	1.4
None	104	28.7

Following table-2 there were 16.6% study subject who has diabetes mellitus, 15.5% of the study subject has hypertension, 13.8% of the study participants has dyslipidemia, 11% of the study participants has peptic ulcer, 5.8% study subject has asthma, 4.4% participants has chronic kidney disease, 1.9% participants has anemia, 1.4% has headache and 28.7% replied none that they don't have any other disease.

4.2: Level of knowledge, attitude and practice towards rational use of antibiotics.

Table 3:Distribution of level of knowledge , attitude and practice towards rational use of antibiotics of the participants (n=362)

Level of knowledge	Number (n) Mean-15.7,SD-2.81 Minimum-8 Maximum-21	Percentage (%)
Poor (<60% correct answer)	34	9.4
Moderate (60-80% correct answer)	168	46.4
Good (>80% correct answer)	160	44.2
Level of attitude	**Number(n)**	**Percentage(%)**

	Mean±SD(83±7) **Minimum-59** **Maximum-102**	
Poor (<76=Mean-SD)	55	15.2
Moderate(76-90=Mean-SD to Mean+SD)	245	67.7
Good(>90=Mean+SD)	62	17.1
Level of Practice	**Number(n)** **Mean±SD(71±6)** **Minimum-51** **Maximum-85**	**Percentage(%)**
Poor(<65=Mean-SD)	45	12.4
Moderate(65-77= Mean-SD to Mean+SD)	263	72.7
Good(>77=Mean+SD)	54	14.9

The test for knowledge about rational use of antibiotics carried 21 questions consist of both positive and negative statement. For this section, when the respondent answered correct knowledge about rational use of antibiotics, 1 score was given. On the other hand, if the answer is incorrect or do not know, 0 score was given . Knowledge score can be 0 to 21. Maximize obtainable score for this part is 21 points.

Bloom's cut off point was used for classification of knowledge score. Respondents who answered more than 80% correctly was considered as "Good Knowledge level", respondents who answered 60% to 80% correctly was considered as "Moderate knowledge level" and respondents who answered less than 60 % correctly was considered as "Poor knowledge level.

According to table:3 , distribution of level of knowledge towards rational use of antibiotics of the study participants showed that majority(46.4%) of the study participants had moderate level of knowledge followed by 44.2% had good level of knowledge and 9.4% had poor level of knowledge .Mean knowledge score was 15.7±2.81, Maximum knowledge score was 21 and minimum knowledge score was 8.

The test for attitude towards rational use of antibiotics carried 22 questions. For this section 5 points Likert scale was used and the respondent answered five options, “strongly agree, agree, not sure, disagree and strongly disagree”.

Attitude score will be categorized into three attitude level using the mean score of respondents and standard deviation. “Good or high attitude” was categorized by score more than to mean plus standard deviation. “Moderate attitude” was categorized by score between mean plus standard deviation and mean minus standard deviation. “Poor attitude” was categorized by less than mean minus standard deviation.

According to table:3, distribution of level of attitude towards rational use of antibiotics of the study participants showed majority (67.7%) of the study participants had moderate level of attitude followed by 62 participants(17.1 %) had good attitude and 55 participants (15.2%) had poor attitude towards rational use of antibiotics. Mean attitude score was 83±7, Maximum attitude score was 102 and minimum score was 59.

The test for practice towards rational use of antibiotics carried 29 questions. For this section answer has 3 levels: “Usually” means respondents practice more than half of their time. “Sometimes” means respondent practice one third to half of their times. “Never” means respondent practice less than one third of their times.

For scoring, if the respondent answer usually, 3 score was given. If the respondent answer sometime, 2 score was given. If the respondent answer never , 1 score was given. For incorrect practice reverse scoring was given. Total practice question is 29 . So, practice score can be 29 to 87.

Practice score was categorized into three level using the mean score of respondents and standard deviation. “Good or high practices” is categorized by score more than to mean plus standard deviation. “Moderate practice” level is categorized by score between mean plus standard deviation and mean minus standard deviation. “Poor practice” level is categorized by less than mean minus standard deviation.

According to table:3**,** distribution of level of practice towards rational use of antibiotics of the study participants showed majority 72.4% of the study participants had moderate level of attitude followed by 55 participants (15.2%) had good practice and 45 participants (12.4%) had poor practice towards rational use of antibiotics. Mean practice score was 71±6, Maximum practice score was 85 and minimum score was 51.

Table 4:Frequency and percentage of participants who answered correctly to statement on knowledge about rational use of antibiotics (n=362)

No	Statement	Correct(n, %)
1.	Amoxicillin/penicillin is an antibiotic.	331(91.4)
2*	Aspirin is an antibiotic.	308(85.1)
3*	Paracetamol is an antibiotic.	319(88.1)
4	Antibiotic are useful for bacterial infection.	313(86.5)
5*	Antibiotic are useful for viral infection like flu.	228(63.0)
6*	Antibiotic are useful for both bacterial and viral infection.	242(66.9)
7*	Antibiotic are same as anti-inflammatory agents e.g. paracetamol.	263(72.7)
8	Antibiotic can causes side effects such as nausea, vomiting, diarrhea.	307(84.8)
9	Antibiotic can causes allergic reactions such as rash in body, swollen lip and eye, palpitation, breathing difficulty.	295(81.5)
10	Antibiotic can cause secondary infections after killing good bacteria present in our body.	228(63.0)
11	Bacterial infection can spread through contact with person who has infection.	253(69.9)
12	Bacterial infection can spread through contact with animal, food, or water carrying antibiotic resistance Bacteria.	241(66.6)
13	Misuse of antibiotic can lead to antibiotic resistance.	271(74.9)
14	The more antibiotic we use in society , the higher the risk of resistance development and spreads.	275(76.0)
15	Bacteria can become resistant to antibiotics.	217(59.9)

16	Unfinished antibiotics dose is the cause for bacterial resistance.	256(70.7)
17	If someone have antibiotic resistance he can not use same medicine for infection treatment.	232(64.1)
18	One must take all antibiotic doses until finish the recommended course by physician.	270(74.6)
19*	Unfinished antibiotic can be store for future use.	290(80.1)
20	One should not use hot water to dissolve pediatric antibiotics, because hot water can destroy efficacy of antibiotics.	271(76.5)
21	Heat and direct sunlight can damage antibiotics.	291(80.4)

*Negative Statement

Following table -4 frequency and percentage of study participants who answered true ,false to each statement on knowledge about rational use of antibiotics were demonstrated. Statement 2, 3, 5,6,7 and 19 are negative regarding knowledge about rational use of antibiotics.

Statement item 1-3 identified knowledge of participants about identification of antibiotics. Item-1 is correct statement “Amoxicillin/penicillin is an antibiotic” and majority 331 participants (91.4%) identified correctly and only 31 participants(8.6%) answered wrong. Item-2 and item-3 are incorrect statement regarding identification of antibiotics. Item-2 is “Aspirin is an antibiotic” and majority 308 participants(85.1%) answered correctly it’s a false statement, whereas 54 participants (14.9%) answered as true statement which is incorrect. Item-3 is “Paracetamol is an antibiotic” and majority 319 subjects (88.1%) answered as false which is correct , only 43 participants (11.9%) answered as true statement which is wrong.

Statement item 4-7 identified knowledge of participants for appropriate indications of antibiotics. Statement item -4 is a correct statement “Antibiotic are useful for bacterial infection” and majority 313 participants (86.5%) answered correctly and 49 participants (13.5%)answered wrong. Item-5, item-6, item-7 are negative statement regarding appropriate indications of antibiotics. Item-5 is “Antibiotic are useful for viral infection like flu” and more than one third of participants(37%) response as true which is wrong and 63% (228subjects) response as false which is correct. Item-6 is “Antibiotic are useful for both bacterial and viral infection” and one third of the participants (33.1%) answered as true which is a wrong perception, two third of participants (66.9%) answered correctly as it is a false statement. Item-7 is “Antibiotic

are same as anti-inflammatory agents e.g. paracetamol" and majority of the participants 72.7%(263subjects) answered that it is a false statement which is correct and 27.3% respondents(99subjects) said it is true which is wrong.

Statement-8 & statement-9 used to identified knowledge of respondents for antibiotics allergy and side effects. Statement-8 is "Antibiotic can causes side effects such as nausea, vomiting, diarrhea" and majority of the of the participants has good knowledge while 307 participants (84.8%) response as true and 55 respondents(15.2%) reply as false. Statement-9 is "Antibiotic can causes allergic reactions such as rash in body, swollen lip and eye, palpitation, breathing difficulty" and majority of the participants 295 subjects(81.5%) reply back as true which is a correct knowledge and 67 subjects (18.5%) has a wrong perception on this statement.

Regarding item 10-12 which was used to identified knowledge of respondents about infections. Item-10 is "Antibiotic can cause secondary infections after killing good bacteria present in our body" and majority of the participants 228 subjects (63%) reply back as true which is correct knowledge and 134 subjects (37%) has wrong perception for this statement. Item-11 is "Bacterial infection can spread through contact with person who has infection" and majority of the participants 253 subjects(69.9%) replied as true which is correct and 107 subjects (29.6%) had wrong knowledge regarding this statement. Item- 12 is "Bacterial infection can spread through contact with animal, food, or water carrying antibiotic resistance Bacteria" and two-third of respondents 241subjects (66.6%) has proper knowledge and one-third participants 121 subjects(33.4%) has wrong knowledge for this statement.

Statement 13-17 used to identified knowledge regarding antibiotics resistance. Statement-13 is "Misuse of antibiotic can lead to antibiotic resistance" and 271 participants (74.9%) replied correctly and 91 participants (25.1%) has wrong perception in this statement. Item-14 is "The more antibiotic we use in society , the higher the risk of resistance development and spreads" and majority of the participants76%(275 subject) has correct knowledge and 24% (87subject) has incorrect knowledge. Item-15 is " Bacteria can become resistant to antibiotics" and 59.9% of respondents(217 subjects) has proper knowledge and whereas 40.1% of respondents(145 subjects) thinks it's a false statement which is incorrect perception. Item-16 is "Unfinished antibiotics dose is the cause for bacterial resistance" and majority respondents 256 subjects(70.7%) replied as true which is correct and 106 participants (29.3%) thinks it is a false statement which is wrong knowledge. Item-17 is "If someone have antibiotic resistance he can not use same medicine for infection treatment" and 232 respondents (64.1%) replied as a true statement which is correct and 130 participants(35.9%) thinks that it's a false statement which is incorrect .

Statement-18 used to identified knowledge about compliance and completion of antibiotic course. Item-18 is "One must take all antibiotic doses until finish the

recommended course by physician" and majority 74.6% answered as true which is correct and 25.4% replied as false which is incorrect knowledge.

Statement-19 used to check knowledge about leftover antibiotics. Item-19 is "Unfinished antibiotic can be store for future use" and majority 80.1 % reply back as false which is correct knowledge about leftover antibiotics and 19.9% participants answered as true which incorrect perception.

Statement-20 used to check knowledge regarding antibiotic for children. Item- 20 is "One should not use hot water to dissolve pediatric antibiotics, because hot water can destroy efficacy of antibiotics" and majority 76.5% answered as true which is correct knowledge and 23.1% answered as false which incorrect knowledge.

Statement-21 is regarding knowledge about storage of antibiotic . Item-21 is "Heat and direct sunlight can damage antibiotics" and 80.4% answered as true that is correct knowledge and 19.6% replied as false which is incorrect regarding storage of antibiotics.

Table 5:Frequency and percentage of participants who answered ("Strongly agree" "agree" "not sure" "disagree" and "strongly disagree") to statement on attitude towards rational use of antibiotics (n=362)
SA-Strongly agree, A-Agree, NS-Not sure, D-Disagree, SD-Strongly disagree

No	Statement	SA(n,%)	A(n,%)	NS(n,%)	D(n,%)	SD(n,%)
1	I think one should buy antibiotics with physician prescription.	193(53.3)	92(25.4)	33(9.1)	34(9.4)	10(2.8)
2*	I think that it is good to be able to buy antibiotics without seeing a physician	3(0.8)	48(13.3)	51(14.1)	192(53.0)	68(18.8)
3*	I think it is good that one can buy antibiotic without prescription in pharmacies.	7(1.9)	41(11.3)	56(15.5)	187(51.7)	71(19.6)
4	I know which medicines are the antibiotics when I take cold medicine.	182(50.3)	91(25.1)	34(9.4)	53(14.6)	2(0.6)
5*	I prefer to take same antibiotics that worked before because it helps save more money.	10(2.8)	45(12.4)	69(19.1)	199(55.0)	39(10.0)
6*	I prefer to buy same antibiotics that worked before because it helps save time to visit hospital.	7(1.9)	44(12.2)	87(24.0)	192(53.0)	32(8.8)

7*	Antibiotics make one recover faster when having a cold.	14(3.9)	61(16.9)	81(22.4)	150(41.4)	56(15.5)
8*	If one's mucous changed color when having a cold i.e. clear to yellowish or greenish , always need antibiotics to get rid of the cold.	11(3.0)	59(16.3)	97(26.8)	97(26.8)	98(27.1)
9*	I prefer antibiotic injections to recover from infection faster.	25(6.9)	74(20.4)	58(16.0)	91(25.1)	114(31.5)
10*	I would stop taking the prescribed antibiotics if I got better.	9(2.5)	46(12.7)	29(8.0)	185(51.1)	93(25.7)
.11*	I take left-over antibiotics when I have similar flu symptoms.	14(3.9)	64(17.7)	35(9.7)	170(47.0)	79(21.8)
12*	Leftover antibiotics can be saved for personal future use or to give someone else.	9(2.5)	75(20.7)	57(15.7)	155(42.8)	66(18.2)
13	Leftover antibiotics should be taken back to the pharmacy.	204(56.4)	65(18.0)	56(15.5)	30(8.3)	7(1.9)
14	The body can usually fight mild infections	142(39.2)	131(36.2)	42(11.6)	32(8.8)	15(4.1)

	on its own without antibiotics.					
15	If I get an infection I often wait and see whether infection goes away on its own.	121(33.4)	134(37.0)	47(13.0)	53(14.6)	7(1.9)
16	A persistent cough (longer than one week) always need to be treated with antibiotics to disappear.	85(23.5)	141(39.0)	71(19.6)	51(14.1)	14(3.9)
17*	It is appropriate to take antibiotics when having a sore-throat and a cold, otherwise one may suffer complications.	14(3.9)	41(11.3)	62(17.1)	133(36.7)	112(30.9)
18	It is appropriate to take antibiotics for tonsillitis, otherwise one may suffer complications.	201(55.5)	73(20.2)	39(10.8)	30(8.3)	19(5.2)
19*	An ear infection in a 3-6 years old child always need to be treated with antibiotics.	20(5.5)	52(14.4)	102(28.2)	101(27.9)	87(24.0)
20*	I think one should share their leftover antibiotics with their friends.	6(1.7)	34(9.4)	54(14.9)	194(53.6)	74(20.4)

21*	I change physician if physician does not prescribe antibiotics.	2(0.6)	22(6.1)	49(13.5)	198(54.7)	91(25.1)
22*	I think hot water dissolve pediatric antibiotics dry powder well and increase efficacy of the medicine.	2(0.6)	16(4.4)	55(15.2)	187(51.7)	102(28.2)

*Negative Statement

Following table -5 frequency and percentage of study participants who answered Strongly agree, agree, not sure, disagree and strongly disagree to statement on attitude towards rational use of antibiotics were displayed. Statement 1,4, 13-16 and 18 are positive statement regarding attitude towards rational use of antibiotics.

Statement item 1-6, 21 are composed of regarding attitude of source of antibiotics.

Item-1 is “I think one should buy antibiotics with physician prescription” this is a positive attitude and half of the participants (53.3%) strongly agreed with this statement ,25.4% agreed while 9.1% are not sure , 9.4% are disagreed and 2.8% are strongly disagreed with this statement.

Item-2 is “I think that it is good to be able to buy antibiotics without seeing a physician” this a negative statement attitude and majority of the participants 53% disagreed and 18.8% strongly disagreed with the statement which is good attitude while 14.1% are not sure , 13.3% are agreed and 0.8% are strongly agreed with this statement.

Item-3 is “I think it is good that one can buy antibiotic without prescription in pharmacies” this is a negative statement towards attitude and majority half of the participants 51.7% disagreed and 19.6% participants strongly disagreed with the statement which a good attitude, while 15.5% are not sure, 11.3% are agreed and 1.9% are strongly agreed with the statement.

Item-4 is “I know which medicines are the antibiotics when I take cold medicine” this is a positive statement where 50.3% participants are strongly agreed, 25.1% agreed with the statement that they know which medicine is antibiotics while 9.4% are not sure , 14.6% are disagreed and 0.6% are strongly disagreed with the statement.

Item-5 is “I prefer to take same antibiotics that worked before because it helps save more money” this is a negative statement where majority 55% respondents disagreed

and 10.8% strongly disagreed with the statement which is good attitude, on the other hand 19.1% are not sure , 12.4% agreed, 2.8% are strongly agreed with the statement which is wrong attitude.

Item-6 is “I prefer to buy same antibiotics that worked before because it helps save time to visit hospital” regarding attitude this is a negative statement where 53% participants disagreed and 8.8% strongly disagreed with the statement which is a good attitude . meanwhile 24% of the respondents are not sure , 12.2% agreed, 1.9% are strongly agreed with the statement.

Item-21 is” I change physician if physician does not prescribe antibiotics” this is a negative attitude and 54.7% disagreed , 25.1% strongly disagree that they don’t change physician while 13.5% are not sure , 6.1% are agreed , 0.6% are strongly agreed with statement.

Statement item 7-9, 16-19 are regarding attitude towards indications of antibiotics .

Item-7 is “Antibiotics make one recover faster when having a cold” this is a negative attitude statement and 41.4% participants disagreed , 15.5% participants are strongly disagreed while 22.4% are not sure followed by 16.9%agreed, 3.9% are strongly agreed with the statement.

Item-8 is “If one’s mucous changed color when having a cold i.e. clear to yellowish or greenish , always need antibiotics to get rid of the cold” this is a negative attitude statement where 27.1% participants strongly disagreed ,26.8% disagreed with the statement, while 26.8% are not sure, 16.3% are agreed and 3% are strongly agreed with the statement.

Item-9 is “I prefer antibiotic injections to recover from infection faster” this is a negative attitude statement where 31.5% respondents strongly disagreed , 25.1% disagreed with the statement, on the other hand 8% are not sure, 20.4% agreed and 6.9% are strongly agreed with the statement.

Item-16 is “A persistent cough (longer than one week) always need to be treated with antibiotics to disappear” this is positive attitude statement where majority 39% agreed,23.5% strongly agreed with the statement , at the same time 19.6% are not sure, 14.1% disagreed and 3.9% are strongly disagreed with the statement.

Item-17 is “It is appropriate to take antibiotics when having a sore-throat and a cold, otherwise one may suffer complications” this is a negative attitude statement where majority 36.7 % disagreed, 30.9% strongly disagreed with the statement, while 17.1% are not sure ,11.3% agreed and 3.9% are strongly agreed with this negative attitude statement.

Item-18 is “It is appropriate to take antibiotics for tonsillitis, otherwise one may suffer complications” this is a positive attitude statement where 55.5% strongly agreed,

20.2% agreed, while 10.8% not sure ,8.3% disagreed and 5.2% are strongly disagreed with the statement.

Item-19 is “An ear infection in a 3-6 years old child always need to be treated with antibiotics” this is a negative attitude statement where majority 28.2% are not sure ,27.9% disagreed, 24% strongly disagreed with the statement while 14.4% agreed and 5.5% strongly agreed with the statement.

Statement item 11-13,20 are regarding attitude towards leftover antibiotics.

Item-11 is “I take left-over antibiotics when I have similar flu symptoms” this is a wrong attitude statement where 47% disagreed,21.8% strongly disagreed with the statement, at the same time 9.7% are not sure, 17.7% agreed,3.9% are strongly agreed with this statement.

Item-12 is “Leftover antibiotics can be saved for personal future use or to give someone else” this is a negative attitude statement where 42.8% disagreed, 18.2% strongly disagreed with the statement, while 15.7% are not sure,20.7% agreed and 2.5% are strongly agreed with this negative attitude statement.

Item-13 is “Leftover antibiotics should be taken back to the pharmacy” majority 56.4% respondents strongly agreed , 18% agreed with this statement where as 15.5% are not sure , 8.3% disagreed, 1.9% strongly disagreed with this statement.

Item-20 is “I think one should share their leftover antibiotics with their friends” this is a wrong attitude statement where majority 53.6% disagreed,20.4% strongly disagreed with the statement.28.2% are not sure , 14.4% agreed,5.5 % are strongly agreed with the statement.

Statement item 14-15 are regarding attitude towards infection control

Item-14 is “The body can usually fight mild infections on its own without antibiotics” this is a positive attitude statement where 39.2% strongly agreed, 36.2% agreed with the statement while 11.6% are not sure ,8.8% disagreed,4.1% strongly disagreed with the statement.

Item-15 is “If I get an infection I often wait and see whether infection goes away on its own” majority 37% agreed with this statement where 33.4% strongly agreed with the statement, at the same time 13% are not sure, 14.6% disagreed and 1.9% strongly disagreed with the statement.

Statement item-10 is towards compliance and completion of antibiotic course. Item 10 is “I would stop taking the prescribed antibiotics if I got better” majority 51.1% disagreed with the statement,25.7% strongly disagreed , 8% are not sure,12.7% agreed, 2.5% are strongly agreed with the statement.

Statement item-22 is regarding administration of pediatrics antibiotics. Item-22 is “I think hot water dissolve pediatric antibiotics dry powder well and increase efficacy of the medicine” this is a false attitude statement, majority participants 51.7% disagreed with the statement, 28.2% strongly disagreed, 15.2% are not sure, 4.4% agreed and 0.6% strongly agreed with this wrong statement.

Table 6:Frequency and percentage of participants who answered (Usually, sometimes, never)to statement on practice regarding rational use of antibiotics (n=362).

No	Statement	Usually(n,%)	Sometimes(n,%)	Never(n,%)
1*	I take antibiotics every time that I start to feel unwell.	107(29.6)	141(39.0)	114(31.5)
2*	I search for leftover antibiotics in my house to use.	32(8.8)	163(45.0)	167(46.1)
3*	I request doctor or healthcare professional to give antibiotic injection for relieving illness.	37(10.2)	137(37.8)	188(51.9)
4*	I buy antibiotics by telling trade name I prefer.	71(19.6)	146(40.3)	145(40.1)
5*	I buy antibiotics by bringing old antibiotics packaging or the sample of used antibiotics previously used.	54(14.9)	135(37.3)	173(47.8)
6*	I buy antibiotics by suggestions from friends and family members.	19(5.2)	154(42.5)	189(52.2)

7*	I buy antibiotics by suggestions from advertisement in television, radio, newspaper and internet.	13(3.6)	91(25.1)	258(71.3)
8*	I distribute antibiotics that make my illness better to other person who have the same symptom	16(4.4)	111(30.7)	235(64.9)
9*	I stop taking antibiotics as soon as symptoms are relieved.	39(10.8)	104(28.7)	219(60.5)
10*	I keep stock some antibiotics at home in case emergency.	21(5.8)	158(43.6)	183(50.6)
11*	I usually ask physician to prescribe antibiotics.	42(11.6)	112(30.9)	208(57.5)
12	I follow all the instructions of the physician when using antibiotics.	281(77.6)	46(12.7)	35(9.7)
13*	I ask drug seller to suggest antibiotics.	16(4.4)	101(27.9)	245(67.7)
14	I trust physician decision when deciding not to prescribing antibiotics.	275(76.0)	45(12.4)	42(11.6)
15	Antibiotics should be administered with a prescription.	245(67.7)	79(21.8)	38(10.5)
16*	I change physician for not prescribing antibiotics.	27(7.5)	119(32.9)	216(59.7)

17*	I ask friends and family to buy antibiotics for me.	15(4.1)	158(43.6)	189(52.2)
18*	I take antibiotics without looking label of information on sachet or packaging.	38(10.5)	144(39.8)	180(49.7)
19	I read label of information, medicine name, indications before taking antibiotics.	233(64.4)	90(24.9)	39(10.8)
20	I check for manufacturing date and expiry date before taking antibiotics.	230(63.5)	93(25.7)	39(10.8)
21	I do not take food or drink while taking antibiotics.	175(48.3)	72(19.9)	115(31.8)
22*	I increase antibiotics dose by myself to recover faster.	24(6.6)	86(23.8)	252(69.6)
23*	I increase antibiotics dose if symptoms not getting better.	16(4.4)	93(25.7)	253(69.9)
24*	I dissolve antibiotics tablets/capsules in water before taking.	31(8.6)	103(28.5)	228(63)
25*	If I forget to take dose of antibiotics, next time I will take double dose by myself.	25(6.9)	108(29.8)	229(63.3)
26	I observe for allergic symptom such as rash,	137(37.8)	155(42.8)	70(19.3)

	swelling, nausea, vomiting or breathing difficulty, after taking antibiotics.			
27*	I store antibiotics in kitchen.	20(5.8)	175(48.5)	167(46.1)
28*	I store antibiotics in refrigerator.	17(4.7)	178(49.2)	167(46.1)
29	I store antibiotics in cool and dry place.	233(64.4)	96(26.5)	33(9.1)

*Negative Statement

Following table -6 frequency and percentage of study participants who answered usually, sometimes and never to statement on practice regarding rational use of antibiotics were displayed. Statement 12, 14, 15, 19-21, 26 and 29 are positive statement towards practice regarding rational use of antibiotics.

Item 1 ,3 for appropriate indications of antibiotics, Item 1 is “I take antibiotics every time that I start to feel unwell” majority 39% respondents sometimes takes antibiotics every time that they start to feel unwell, while 31.5% never takes antibiotics every time. Item-3 is “I request doctor or healthcare professional to give antibiotic injection for relieving illness” majority 51.9% never request doctor or healthcare professional to give antibiotic injection for relieving illness.

Item 21-25 for administration of antibiotics, Item 21 is “I do not take food or drink while taking antibiotics” majority 48.3% usually do not take food or drink while taking antibiotics. Item 22 is “I increase antibiotics dose by myself to recover faster ” majority 69.6% never increase dose to recover faster. Item 23 is “I increase antibiotics dose if symptoms not getting better” majority 69.9% never increase antibiotics dose if symptoms not getting better, Item-24 is “I dissolve antibiotics tablets/capsules in water before taking” majority 63% never dissolve antibiotics tablet or capsules in water before taking. Item 25 is “If I forget to take dose of antibiotics, next time I will take double dose by myself” majority 63.3% never double dose by themselves.

Item 9,12,14 for compliance and completion of antibiotics course, Item 9 is “I stop taking antibiotics as soon as symptoms are relieved” majority 60.5% never stop taking antibiotics as soon as symptoms are relieved. Item 12 is “I follow all the instructions of the physician when using antibiotics” majority 77.6% usually follow all the instructions of the physician when using antibiotics. Item 14 is “I trust physician

decision when deciding not to prescribing antibiotics" majority 76% usually trust physician decision when deciding no to prescribing antibiotics.

Item 2,6,15-17 for source of antibiotics and method to collection, Item- 2 majority 46.1% never search for leftover antibiotics in their house to use, followed by 45% sometimes search for leftover antibiotics. Item- 6 majority 52.2% never buy antibiotics by suggestions from friends and family member while 42.5% sometimes buy antibiotics by suggestions from friends and family. Item -15 majority 67.7% usually thinks that antibiotics should be administered with a prescription. Item-16 majority 59.7% never change physician for not prescribing antibiotics. Item-17 majority 52.2% never ask friends and family to buy antibiotics for them.

Item 18-20 for label reading and check for trade name ,expiry date. Item-18 majority 49.7% never take antibiotics without looking label of information on sachet or packaging . Item-19 majority 64.4% usually read label of information ,medicine name , indications before taking antibiotics. Item-20 majority 63.5% usually check for manufacturing date and expiry date before taking antibiotics.

Item 4,5,7,11,13 for self medication. Item-4 majority 40.3% sometimes buy antibiotics by telling trade name they prefer while 40.1% never did this. Item-5 majority 47.8% never buy antibiotics by bringing old antibiotics packaging or the sample of used antibiotics previously used. Item-7 majority 71.3% never buy antibiotics from suggestions from advertisement in television , radio, newspaper and internet. Item-11 majority 57.5% never asked physician to prescribe antibiotics. Item-13 majority 67.7% never asked drug seller to suggest antibiotics.

Item- 8 for sharing antibiotics with others, majority 64.9% never distribute antibiotics to other person who have the same symptom.

Item -10 for antibiotics for emergency, majority 50.6% never keep stock some antibiotics at home in case of emergency while 43.6% replied sometimes keep stock at home.

Item -26 for antibiotics allergy and side effects, majority 42.8% sometimes observe for allergic symptom such as rash, swelling, nausea, vomiting or breathing difficulty, after taking antibiotics while 37.8% usually check for allergic symptom.

Item 27-29 for storage of antibiotics. Item-27 majority 48.3% sometimes and 46.1% never store in kitchen. Item-28 majority 49.2% sometimes and 46.1% never store antibiotics in refrigerator. Item-29 majority 64.4% usually store antibiotics in cool and dry place.

4.3: Association between sociodemographic factors and level of knowledge, attitude and practices towards rational use of antibiotics.

Association between sociodemographic factors and level of knowledge, attitude and practices towards rational use of antibiotics were demonstrated . Chi square test was the statistical measurement used. Significant difference were determined at P-value <0.05.

There were significant association between level of knowledge about rational use of antibiotics and antibiotic use within last 1year.

There were significant association between level of practice towards rational use of antibiotics and education, family member related with health profession, antibiotic use within last 1year.

There were significant association between level of practice regarding rational use of antibiotics and family member related with health profession.

Following tables are representing association between sociodemographic factors and level of knowledge, level of attitude , level of practice towards rational use of antibiotics.

4.3.1 Association between sociodemographic factors and level of knowledge about rational use of antibiotics.

Table 7:Association between sociodemographic factors and level of knowledge about rational use of antibiotics

Sociodemographic factors	**Level of knowledge**			**Chi-square**	**P-value**
	Poor (n,%)	Moderate (n,%)	Good (n,%)		
Sex					
Male	17(8.3)	96(47.1)	91(44.6)	0.618	0.734
Female	17(10.8)	72(45.6)	69(43.7)		
Age(years)					
18-32	7(8.3)	37(44.0)	40(47.6)	1.853	0.938#
33-47	18(10.9)	76(46.1)	71(43.0)		
48-62	6(7.9)	35(46.1)	35(46.1)		
63-75	3(8.1)	20(54.1)	14(37.8)		
Religion					

Islam	28(9.5)	139(47.3)	127(43.2)	2.362	0.671#
Hindu	2(5.9)	17(50.0)	15(44.1)		
Others (Buddhist, Christian)	4(16.8)	12(35.3)	18(52.9)		
Marital Status					
Single	3(5.2)	29(50.0)	26(44.8)	5.268	0.257#
Married	27(10.6)	122(47.8)	106(41.6)		
Widowed,separated, divorce	4(8.2)	17(34.7)	28(57.1)		
Education					
Higher secondary	1(6.7)	10(66.7)	4(26.7)	5.126	0.255#
Bachelor degree	21(12.1)	77(44.5)	75(43.4)		
Masters degree and above	12(6.9)	81(46.6)	81(46.6)		
Occupation					
Business	15(10.6)	68(47.9)	59(41.5)		
Service	6(5.7)	46(43.8)	53(50.5)	8.893	0.342#
Govt. officer	4(13.8)	10(34.5)	15(51.7)		
Students	3(7.9)	17(44.7)	18(47.4)		
Other	6(12.5)	27(56.3)	15(31.3)		
Monthly Income(USD)	30(9.8)	140(45.8)	136(44.4)	0.568	0.753
1000-4900	4(7.1)	28(50.0)	24(42.9)		
5000-10000					
Family member in health Yes	3(6.8)	15(34.1)	26(59.1)	4.230	0.123#
No	31(9.7)	153(48.1)	134(42.1)		
Antibiotic use within 1year	29(13.8)	96(45.7)	85(40.5)	12.847	0.002*
Yes	5(3.3)	72(47.4)	75(49.3)		

No						
Any other medication	Yes	18(9.0)	101(50.5)	81(40.5)	3.068	0.216
	No	16(9.9)	67(41.4)	79(48.8)		

*Significant difference at p-value (<0.05), #Fisher's Exact test

According to table-7 association between sociodemographic factors and level of knowledge about rational use of antibiotics were displayed. There were significant associations between knowledge with antibiotics use within last 1year (P-value-0.002) .

4.3.2 Association between sociodemographic factors and level of attitude towards rational use of antibiotics.

Table 8:Association between sociodemographic factors and level of attitude towards rational use of antibiotics.

Sociodemographic factors	**Level of attitude**			**Chi-square**	**P-value**
	Poor(n,%)	Moderate(n,%)	Good(n,%)		
Sex					
Male	29(14.2)	138(67.6)	37(18.1)	0.573	0.751
Female	26(16.5)	107(67.7)	25(15.8)		
Age(years)					
18-32	13(15.5)	53(63.1)	18(21.4)	9.929	0.128
33-47	28(17.0)	119(72.1)	18(10.9)		
48-62	11(14.5)	49(64.5)	16(21.1)		
63-75	3(8.1)	24(64.9)	10(27.0)		
Religion					
Islam	46(15.6)	195(66.3)	53(18.0)	1.645	0.801
Hindu	5(14.7)	24(70.6)	5(14.7)		
Others (Buddhist, Christian)	4(11.8)	26(76.5)	4(11.8)		
Marital Status					
Single	7(12.1)	39(67.2)	12(20.7)	3.821	0.431
Married	42(16.5)	175(68.6)	38(14.9)		

Widowed/separated/ divorce	6(12.2)	31(63.3)	12(24.5)		
Education					
Higher secondary	3(20.0)	12(80.0)	0(0)	15.124	0.003#
Bachelor degree	30(17.3)	124(71.7)	19(11.0)		
Masters degree and above	22(12.6)	109(62.6)	43(24.7)		
Occupation					
Business	27(19.0)	94(66.2)	21(14.8)		
Service	17(16.2)	66(62.9)	22(21.0)	10.113	0.249#
Govt. officer	4(13.8)	20(69.0)	5(17.2)		
Students	4(10.5)	25(65.8)	9(23.7)		
Other	3(6.3)	40(83.3)	5(10.4)		
Monthly Income(USD) 1000-4900	49(16.0)	210(68.6)	47(15.4)	4.746	0.093
5000-10000	6(10.7)	35(62.5)	15(26.8)		
Family member in health Yes	3(6.8)	25(50.8)	6(36.4)	12.081	0.002#
No	52(16.4)	220(69.2)	46(14.5)		
Antibiotic use within 1year Yes	42(20.0)	131(62.4)	37(17.6)	9.751	0.008*
No	13(8.6)	114(75.0)	25(16.4)		
Any other medication Yes	26(13.0)	140(70.0)	34(17.0)	1.775	0.412
No	29(17.9)	105(64.8)	28(17.3)		

*Significant difference at p-value (<0.05), #Fisher's Exact test

According to table-8 association between sociodemographic factors and level of attitude towards rational use of antibiotics were displayed. There were significant associations between attitude with education (Pvalue-0.004), family member related ith health profession(P-value-0.001) and antibiotics use within last 1year (P-value-0.008) .

4.3.3 Association between sociodemographic factors and level of practice regarding rational use of antibiotics.

Table 9:Association between sociodemographic factors and level of practice regarding rational use of antibiotics.

Sociodemographic factors	Level of practice			Chi-square	P-value
	Poor(n,%)	Moderate(n,%)	Good(n,%)		
Sex					
Male	27(13.2)	144(70.6)	33(16.2)	1.014	0.602
Female	18(11.4)	119(75.3)	21(13.3)		
Age (years)					
18-32	10(11.9)	60(71.4)	14(16.7)	5.701	0.455#
33-47	22(13.3)	122(73.9)	21(12.7)		
48-62	12(15.8)	52(68.4)	12(15.8)		
63-75	1(2.7)	29(78.4)	7(18.9)		
Religion					
Islam	38(12.9)	210(71.4)	46(45.6)	1.509	0.839#
Hindu	3(8.8)	28(82.4)	3(8.8)		
Others (Buddhist, Christian)	4(11.8)	25(73.5)	5(14.7)		
Marital Status					
Single	7(12.1)	45(77.6)	6(10.3)	3.706	0.447
Married	35(13.7)	179(70.2)	41(6.1)		
Widowed/separated/ divorce	3(6.1)	39(79.6)	7(14.3)		
Education					
Higher secondary	3(20.0)	11(73.3)	1(6.7)	6.397	0.150#

Bachelor degree	27(15.6)	124(71.7)	22(12.7)		
Masters degree and above	15(8.6)	128(73.6)	31(17.8)		
Occupation					
Business	24(16.9)	99(69.7)	19(13.4)		
Service	9(8.6)	77(73.3)	19(18.1)	13.314	0.101#
Govt. officer	0(0)	22(75.9)	7(24.1)		
Students	6(15.8)	26(68.4)	6(15.8)		
Other	6(12.5)	39(81.3)	3(6.3)		
Monthly Income(USD)					
1000-4900	38(12.4)	223(72.9)	45(14.7)	0.073	0.964
5000-10000	7(12.5)	7(71.4)	9(16.1)		
Family member in health Yes	2(4.5)	28(63.6)	14(31.8)	12.657	0.002*
No	43(13.5)	235(73.9)	40(12.6)		
Antibiotic use within 1year Yes	30(14.3)	153(72.9)	27(12.9)	2.810	0.245
No	15(9.9)	110(72.4)	27(17.8)		
Any other medication Yes	24(12.0)	143(71.5)	33(16.5)	0.899	0.638
No	21(13.0)	120(74.1)	21(13.0)		

*Significant difference at p-value (<0.05), #Fisher's Exact test

According to table-9 association between sociodemographic factors and level of practice regarding rational use of antibiotics were displayed. There were significant associations between practice with family member related with health profession (P-value-0.002) .

4.4: Association between knowledge level and attitude level towards rational use of antibiotics.

Table 10:Association between knowledge level and attitude level towards rational use of antibiotics

	Attitude			Chi-square	P-value
Variables	Poor	Moderate	Good		
Knowledge	n(%)	n(%)	n(%)		
Poor	19(55.9)	15(44.1)	0		
Moderate	33(19.6)	123(73.2)	12(7.1)	95.717	<0.001*
Good	3(1.9)	107(66.9)	50(31.3)		

*Significant difference at p-value (<0.05)

According to table 10 there was significant association between knowledge level and attitude level towards rational use of antibiotics (P-value <0.001) .

4.5: Association between knowledge level and practice level towards rational use of antibiotics.

Table 11:Association between knowledge level and practice level towards rational use of antibiotics.

Variables		**Practice**		**Chi-square**	**P-value**
	Poor	Moderate	Good		
Knowledge	n(%)	n(%)	n(%)		
Poor	15(44.1)	18(52.9)	1(2.9)		
Moderate	23(13.7)	136(81.0)	9(5.4)	62.207	<0.001#
Good	7(4.4)	109(68.1)	44(27.5)		

*Significant difference at p-value (<0.05), #Fisher's Exact test

According to table 11 there was significant association between knowledge level and practice level towards rational use of antibiotics (P-value <0.001).

4.6: Association between attitude level and practice level towards rational use of antibiotics.

Table 12:Association between attitude level and practice level towards rational use of antibiotics.

Variables		**Practice**		**Chi-square**	**P-value**
	Poor	Moderate	Good		
Attitude	n(%)	n(%)	n(%)		
Poor	22(40.0)	31(56.4)	2(3.6)		
Moderate	23(9.4)	197(80.4)	25(10.2)	91.849	<0.001*
Good	0(0)	35(56.5)	27(43.5)		

*Significant difference at p-value (<0.05)

According to table 12 there was significant association between attitude level and practice level towards rational use of antibiotics(P-value <0.001) .

4.7: Correlation between knowledge level, attitude level and practice level towards rational use of antibiotics

Table 13:Correlation between knowledge level, attitude level and practice level towards rational use of antibiotics

Variables	**Knowledge**	**Attitude**	**Practice**
Knowledge	**1.000**	.473 (p-<0.001)	.388 (p-<0.001)
Attitude	**.473**** **(p-<0.001)**	1.000	.436 (p-<0.001)
Practice	**.388**** **(p-<0.001)**	**.436**** **(p-<0.001)**	1.000

**Correlation is significant at the 0.01 level (2-tailed)

According to table 13 Spearman rho used to determine correlations between variables. There was moderately strong positive correlation between knowledge and attitude which is statistically significant (r=0.473, P-value-<0.001), The participants who had good knowledge more likely to have good attitude towards rational use of antibiotics. There was weak positive correlation between knowledge level and practice level which is statistically significant(r=0.388, P-value-<0.001), respondents

who have good knowledge tendency to have good practice. There was moderately strong positive correlation between attitude and practice which is statistically significant(r=0.436, P-value-<0.001), study subjects who had good attitude more likely to have good practice regarding rational use of antibiotics.

CHAPTER V
DISCUSSION, CONCLUSION &RECOMMENDATION

5.1 Discussion

In this study a cross sectional analytical research design was used . The main objective was to assess the level of knowledge attitude and practices regarding rational use of antibiotics among Bangladeshi medical tourists in Bangkok, Thailand. Total participants were 362 and response rate were 100%. The tool for data collection was self-administered structured questionnaire was designed based on previously published questionnaire. The questionnaire was developed with the help of literature review and studies regarding antibiotics in worldwide and studies in Thailand and questionnaire item was modified. Questionnaire was validated by three experts in College of Public Health Sciences and was pretested in 30 Bangladeshi medical tourist had similar inclusion criteria. The pretest results were used to develop the questionnaire with a satisfactory Cronbach alpha reliability test score. The data was analyzed by licensed SPSS software version 22 for Chulalongkorn University and descriptive and inferential statistics were used.

5.1.1 Sociodemographic factors

After analysis sociodemographic factors of the respondents, 56.4% of the participants were male and 43.6% were female, Nearly half of the respondents (45.6%) were belong to the age group of 33-47 years old and 23.2% were age group 18-32 years old, majority of the participants (81.2%) were believe in Islam, majority 70.4% were married , 48.1% of the participants finished masters and higher study , whereas 47.8% completed bachelor degree, majority 39.2% participants replied their profession as business and 29% as service, majority of the participants 84.5% were in 1000-4900USD income group, 87.8% mentioned no family member in health profession, 22.7% taking treatment in medicine department , 58% of the respondents used antibiotics within last 1year , 55.2% participants currently using some medications and 71.3% mentioned they have co-morbid diseases.

According to socio-demographic factors 22.7% are taking treatment in medicine department this is may be many people comes to visit primary physician first and do health check-up, 10.5% participants are taking treatment in surgery department and 9.7% are in gynecology department. 71.3% mentioned they have comorbid disease as this group of populations are seeking better medical management for their disease. Study in Poland shows 38% of polish adult use antibiotics within last 1year, Study in Bangladesh among medical students found that more than 50% of students took antibiotics within 1 year, which is similar to current study. With globalization of healthcare many patients from developing country like Bangladesh are travelling to

Thailand. Thailand is a popular destination to Bangladeshi upper-middle class. Thailand has a excellent healthcare and medical tourism system to take care patient which attract many Bangladeshis (Ali & Medhekar, 2018; Mazinska et al., 2017; Mukharjee et al., 2017).

5.1.2 Knowledge about rational use of antibiotics

After analysis level of knowledge(Table-3) towards rational use of antibiotics of the study participants showed that majority(46.4%) of the study participants had moderate level of knowledge followed by 44.2% had good level of knowledge and 9.4% had poor level of knowledge .Mean knowledge score was 15.7±2.81, Maximum knowledge score was 21 and minimum knowledge score was 8.

Regarding knowledge statements study participants had inappropriate and wrong knowledge and misconception. The majority (91.4%) of the study participants replied amoxicillin/penicillin is an antibiotics and 85.1% and 88.1% answered correctly for aspirin and paracetamol is an antibiotic as false respectively for the identifications of antibiotics which is considered as good knowledge. Findings is same direction in a study in Palestine by Abu Taha et al (2016) where 71.2% participants replied correctly(Abu Taha et al., 2016).

Statement identified knowledge of participants for appropriate indications of antibiotics. S “Antibiotic are useful for bacterial infection” and majority 313 participants(86.5%) answered correctly and 49 participants (13.5%)answered wrong. “Antibiotic are useful for viral infection like flu” and more than one third of participants (37%) response as true which is wrong and this is may be people often take antibiotics when they caught common cold, flu or fever. Previous study in Bangladesh among the students of microbiology department in a university shows 23.7% participants has same believe that antibiotics are useful for viral infection, same study found that 48.9 % took antibiotics for faster recovery from common cold and cough(Mukharjee et al., 2017).

Study in Korea Kim et al (2011) found that 30.1% answered correctly that antibiotics cannot use for viral infections. “Antibiotic are useful for both bacterial and viral infection” and one third of the participants (33.1%) answered as true which is a wrong perception. “Antibiotic are same as anti-inflammatory agents e.g. paracetamol” and majority of the participants 72.7%(263subjects) answered that it is a false statement which is correct and . For the appropriate indication of antibiotics participants has inappropriate knowledge and wrong perceptions(Kim et al., 2011).

Study in Thailand by Kanjanachaya Sirijoti(2014) found that majority 62.37% respondents gave right answer that antibiotics are useful for bacterial infections, 44.19% respondents thinks that antibiotics are useful for viral infection like flu which is similar with researcher(Kanjanachaya Sirijoti1, 2014).

Statement which used to identified knowledge regarding antibiotics resistance. “Misuse of antibiotic can lead to antibiotic resistance” 25.1% has wrong perception in this statement. “The more antibiotic we use in society, the higher the risk of resistance development and spreads”24% has incorrect knowledge. “Bacteria can become resistant to antibiotics” 40.1% of respondents thinks it’s a false statement which is incorrect perception. “Unfinished antibiotics dose is the cause for bacterial resistance” 29.3% thinks it is a false statement which is wrong knowledge. “If someone have antibiotic resistance he cannot use same medicine for infection treatment” 35.9% thinks that it’s a false statement which is incorrect .

Regarding antibiotics resistance many of the participants has wrong perceptions, incorrect knowledge. Study in Palestine Abu Taha et al.(2016) found that 82.4% people know that bacteria can become resistance to antibiotics which is similar with this study populations(Abu Taha et al., 2016).

Study in Korea Kim et al.(2011) 64.8% participants has correct knowledge for antibiotic resistance. Findings of present study suggest that knowledge level on rational use of antibiotics and resistance is high among educated and high socioeconomic groups(Kim et al., 2011).

5.1.3 Attitude towards rational use of antibiotics

Distribution of level of attitude (Table-3) towards rational use of antibiotics of the study participants showed majority (67.7%) of the study participants had moderate level of attitude followed by 62 participants(17.1 %) had good attitude and 55 participants (15.2%) had poor attitude towards rational use of antibiotics. Mean attitude score was 83±7, Maximum attitude score was 102 and minimum score was 59.

A total of 21.3% participants disagreed that antibiotics should buy with physician prescriptions , 28.7% thinks that it is good to buy antibiotics without seeing a physician, 43.2% of participants has wrong attitude they thinks antibiotics make them recover faster when having a cold, 24.6% disagree with the statement that they know which medicine are the antibiotics when they take cold medicine,21.6 % participants takes leftover antibiotics when they have similar flu symptoms,23.2% believes antibiotics should be saved for future personal use, 27.3% thinks that antibiotic injections recover infections faster,15.4% would stop taking prescribed antibiotics if they got better,19.5% wants to share their antibiotics with their friend while 28.2% are not sure about their attitude regarding sharing antibiotics. All these findings are about peoples wrong attitude towards rational use of antibiotics.

Previous study in Bangladesh shows majority of participants use antibiotics without physician prescription for fever, pain or flu like symptom(Uddin et al., 2017).Another

study among university student shows 25.5% took antibiotics without physician advice for fever , flu. Same study also found that participants stop taking antibiotics once they feel better. (Mukharjee et al., 2017).Regarding attitude among study participants there were inappropriate attitude towards antibiotic use in many ways. A study in Palestine adult by Abu Taha et al.(2016) found that 65.1% participants believe antibiotics can recover faster when having cold,38.1% prefer antibiotic injection to recover faster,38.7% prefer to take left-over antibiotics when they have similar flu symptom.43.2% stop taking antibiotics when they got better, 24 % participants does not know which medicine is antibiotics(Abu Taha et al., 2016).

Kim et al.(2011) found same 48.2% thinks antibiotics recover cold faster which is wrong attitude towards rational use of antibiotic. Same study also found that 43.8% prefer antibiotic injections to recover faster,46.9% takes leftover antibiotics when they have similar flu symptom, 77.6% would stop taking antibiotics if they got better, only 19.9% know which medicine is antibiotics which is opposite to researcher findings(Kim et al., 2011).

5.1.4 Practice regarding rational use of antibiotics

Distribution of level of practice(Table-3) towards rational use of antibiotics of the study participants showed majority 72.4% of the study participants had moderate level of attitude followed by 55 participants (15.2%) had good practice and 45 participants (12.4%) had poor practice towards rational use of antibiotics. Mean practice score was 71±6, Maximum practice score was 85 and minimum score was 51. There are inappropriate practices regarding rational use of antibiotics .

Statement for appropriate indications of antibiotics, “I take antibiotics every time that I start to feel unwell” majority 39% respondents sometimes takes antibiotics when they start to feel unwell, while 31.5% never takes antibiotics every time. “I request doctor or healthcare professional to give antibiotic injection for relieving illness” majority 51.9% never request doctor or healthcare professional to give antibiotic injection for relieving illness.

Statement for administration of antibiotics, “I do not take food or drink while taking antibiotics” majority 48.3% usually do not take food or drink while taking antibiotics. “I increase antibiotics dose by myself to recover faster ” majority 69.6% never increase dose to recover faster. “I increase antibiotics dose if symptoms not getting better” majority 69.9% never increase antibiotics dose if symptoms not getting better, “I dissolve antibiotics tablets/capsules in water before taking” majority 63% never dissolve antibiotics tablet or capsules in water before taking. “If I forget to take dose of antibiotics, next time I will take double dose by myself” majority 63.3% never double dose by themselves.

Statement for compliance and completion of antibiotics course, “I stop taking antibiotics as soon as symptoms are relieved” majority 60.5% never stop taking antibiotics as soon as symptoms are relieved. “I follow all the instructions of the physician when using antibiotics” majority 77.6% usually follow all the instructions of the physician when using antibiotics. “I trust physician decision when deciding not to prescribing antibiotics” majority 76% usually trust physician decision when deciding no to prescribing antibiotics.

Statement for source of antibiotics and method to collection, majority 46.1% never search for leftover antibiotics in their house to use, followed by 45% sometimes search for leftover antibiotics. Majority 52.2% never buy antibiotics by suggestions from friends and family member while 42.5% sometimes buy antibiotics by suggestions from friends and family. Majority 67.7% usually thinks that antibiotics should be administered with a prescription. Majority 59.7% never change physician for not prescribing antibiotics. Majority 52.2% never ask friends and family to buy antibiotics for them. Statement for label reading and check for trade name ,expiry date. Majority 49.7% never take antibiotics without looking label of information on sachet or packaging. Majority 64.4% usually read label of information, medicine name , indications before taking antibiotics. Majority 63.5% usually check for manufacturing date and expiry date before taking antibiotics.

Statement for self-medication. Majority 40.3% sometimes buy antibiotics by telling trade name they prefer while 40.1% never did this. Majority 47.8% never buy antibiotics by bringing old antibiotics packaging or the sample of used antibiotics previously used. Majority 71.3% never buy antibiotics from suggestions from advertisement in television , radio, newspaper and internet. Majority 57.5% never asked physician to prescribe antibiotics. majority 67.7% never asked pharmacist to suggest antibiotics. Statement for sharing antibiotics with others, majority 64.9% never distribute antibiotics to other person who have the same symptom. Statement for antibiotics for emergency, majority 50.6% never keep stock some antibiotics at home in case of emergency while 43.6% replied sometimes keep stock at home. Statement for antibiotics allergy and side effects, majority 42.8% sometimes observe for allergic symptom such as rash, swelling, nausea, vomiting or breathing difficulty, after taking antibiotics while 37.8% usually check for allergic symptom. Statement for storage of antibiotics, majority 48.3% sometimes and 46.1% never store in kitchen, majority 49.2% sometimes and 46.1% never store antibiotics in refrigerator, majority 64.4% usually store antibiotics in cool and dry place.

Study participants has inappropriate practices regarding rational use of antibiotics. Previous study in Bangladesh among student also shows that participants has good knowledge , attitude but their practice is poor(Kumar Bishwajit Sutradhar1, 2014; Mukharjee et al., 2017).

Study in Thailand by Kanjanachaya Sirijoti1,(2014) found that 37.37% of the respondents took antibiotics sometimes that they started to fee unwell, 18.43% of the respondents request their healthcare professional to give antibiotic injection for relieving illness. Around half of the respondents 58.48% sometimes or never took antibiotics hour before meal. About 13.90% of the study subjects took antibiotics without looking for the label information while 18.19% some times or never read the manufacturing date and expiry date of the antibiotics before consuming it.65.06% of the respondents always or sometimes stop taking antibiotics when they feel better. 19.19% of the respondents took antibiotics by suggestions from their friends, family . 33.84% of the respondents used left over antibiotics and 29.95% kept stock at home in case of emergency(Kanjanachaya Sirijoti1, 2014).

Study in Korea Kim et al (2011) found that 30% of the participants requested antibiotics from health professional for cold.77.6% of the study participants stop taking antibiotics when they feel better.46.9% of the respondents took unconsumed antibiotics(Kim et al., 2011).

Study in KSA Al-Shibani et al (2017) found that 67% stop taking antibiotics when they feel better,31.6% used leftover antibiotics. 52.8% store antibiotics in refrigerator(Al-Shibani et al., 2017).

5.2 Conclusion

Regarding knowledge , attitude and practices towards rational use of antibiotics study participants has inadequate knowledge , wrong attitude and incorrect practices in different ways.

There were significant association between level of knowledge about rational use of antibiotics and antibiotic use within last 1year.There were significant association between level of practice towards rational use of antibiotics and education, family member related with health profession, antibiotic use within last 1year.There were significant association between level of practice regarding rational use of antibiotics and family member related with health profession.

There were significant association between knowledge level and attitude level towards rational use of antibiotics (P-value <0.001). Participants who has good knowledge level were likely to have better attitude towards rational use of antibiotics. There were significant association between knowledge level and practice level towards rational use of antibiotics (P-value <0.001) . Participants who has good knowledge level were likely to had better practice towards rational use of antibiotics. There were significant association between attitude level and practice level towards rational use of antibiotics(P-value <0.001) . Participants who has good attitude level were likely to had better practice regarding rational use of antibiotics. Spearman rho used to determine correlations between variables. There was moderately strong positive correlation between knowledge and attitude which is statistically significant (r=0.473, P-value-<0.001), The participants who had good knowledge more likely to have good attitude towards rational use of antibiotics. There was weak positive correlation between knowledge level and practice level which is statistically significant(r=0.388, P-value-<0.001), respondents who have good knowledge tendency to have good practice. There was moderately strong positive correlation between attitude and practice which is statistically significant(r=0.436, P-value-<0.001), study subjects who had good attitude more likely to have good practice regarding rational use of antibiotics.

5.3 Recommendation

Recommendation for this study could be policy to increase knowledge and awareness regarding antibiotics. Because some of the study participants still have wrong knowledge about rational use of antibiotics, though participants are educated and upper middle -class group. Some participants think that antibiotic are useful for both bacterial and viral infection, some participants are not aware of antibiotic resistance and spread of infectious disease. Some participants has good knowledge but their attitude and practice are different as they are not aware about antibiotic resistance and its

consequences. It seems to researcher more awareness program about rational use of antibiotics will increase peoples knowledge , attitude and practices.

To improve knowledge, attitude, practices more educational program needed which may includes following recommendation.

a. To improve knowledge

1. appropriate indication of antibiotics like antibiotics are only useful for bacterial infection no role of antibiotics for viral infection like flu ,common cold.
2. Knowledge about infection like how bacterial infection spread through human to human contact or animal ,food or water carrying resistance bacteria and spread to human.
3. Knowledge about antibiotics resistance like bacteria becomes resistant to antibiotics , unfinished antibiotic dose increase resistance and once resistance can not use the same medicine again.

b. To improve attitude encourage people

1. to buy antibiotics with resistance physician prescription
2. appropriate antibiotics of antibiotics like stop taking antibiotics to recover faster when having cold.
3. To complete antibiotic course and not to take left over antibiotics .

c. To improve practices to encourage

1. Do not to take antibiotics every time when they start feel unwell.
2. Stop buying antibiotics by trade name, by using package , from friends and family, from advertisement.
3. To complete antibiotic course
4. Do not to buy antibiotics from drug-seller.
5. Antibiotics should be administered with prescriptions of registered physicians.

Recommendation for BGH:

Many medical tourist are coming to Thailand for tourism and treatment purpose, many critical patients are taking treatment in different private hospital . Many of them may have antibiotic resistance may be asymptomatic carrier of microbial resistance microorganism. Hospital should pay more attention about antibiotic use and antibiotic resistance. Management of private hospital should give special attention to Bangladeshi tourists as they are very fast growing.

According to this study Bangladeshi medical tourists has moderate level of knowledge , attitude and practice towards rational use of antibiotics. Hospital should pay more attention to education program to their employee who directly contact with the patient. They can distribute leaflets with proper antibiotic use knowledge to all patients. They can educate their nurse , pharmacist, international coordinator, interpreter about the antibiotic use and consequences of antibiotic resistance. They can emphasize to complete the antibiotic course, to observe antibiotics allergies and side effects, how to store antibiotics properly. Also physician need to be more careful before prescribing any kind of antibiotics.

This study only focusing on medical tourists in BGH . Further research should be conducted with other private hospitals which may includes different nationalities.

Further study need to monitor current status of medical tourists, should increase international collaboration, travel monitoring and surveillance system.

This research does not included any in depth interview. Further research should include in depth-interview from the patient about their antibiotic use , collection of medicine.

A well-planned educational program may , increase peoples knowledge, attitude and practice towards rational use of antibiotics among medical tourists.

Based on the result of this study recommendation as follows:

Media: Media should publish more news report regarding antibiotic use, resistance and consequences. More television program related with antibiotic resistance.

The government: The government should implement awareness program, strict drug policy about stop selling antibiotics without prescriptions.

Program for prescriber education, training in terms antimicrobial drug stewardship for good patient care and reduce the risk of drug resistance. Infection control training , laboratory methods, quality management, improve surveillance system, monitor travel and migration history.

Improve pharmaceutical security system for standard and quality medicine production.

Involvement of animal and plant sector, increase awareness program among poultry, farmers.

Include antibiotics knowledge in early education in the primary and secondary school.

REFERENCES

Abu Taha, A., Abu-Zaydeh, A. H., Ardah, R. A., Al-Jabi, S. W., Sweileh, W. M., Awang, R., & Zyoud, S. H. (2016). Public Knowledge and Attitudes Regarding the Use of Antibiotics and Resistance: Findings from a Cross-Sectional Study Among Palestinian Adults. *Zoonoses Public Health, 63*(6), 449-457. doi:10.1111/zph.12249

Al-Shibani, N., Hamed, A., Labban, N., Al-Kattan, R., Al-Otaibi, H., & Alfadda, S. (2017). Knowledge, attitude and practice of antibiotic use and misuse among adults in Riyadh, Saudi Arabia. *Saudi Med J, 38*(10), 1038-1044. doi:10.15537/smj.2017.10.19887

Ali, M. M., & Medhekar, A. (2018). Healthcare Quality of Bangladesh and Outbound Medical Travel to Thailand. *Economy of Region, 14*(2), 575-588. doi:10.17059/2018-2-19

Basher*, M. A. F. a. A. (2011). Antimicrobial resistance: Bangladesh experience. *Regional Health Forum, volume-15*(number 1).

Diseases, N. F. f. I. (1997). Overview of Antimicrobial Resistance

Dr.M.Ganesh, D. M. G., Dr.S.A.Sridevi, D. S. A. S., & Paul, D. C. M. (2012). Antibiotic use Among Medical and Para Medical Students: Knowledge, Attitude and its Practice in a Tertiary Health Care Centre in Chennai- a Scientific Insight. *International Journal of Scientific Research, 3*(7), 332-335. doi:10.15373/22778179/July2014/98

Ebrahim, M., Gravel, D., Thabet, C., Abdesselam, K., Paramalingam, S., & Hyson, C. (2016). Antimicrobial use and antimicrobial resistance trends in Canada: 2014. *Can Commun Dis Rep, 42*(11), 227-231.

Finley, R. L., Collignon, P., Larsson, D. G., McEwen, S. A., Li, X. Z., Gaze, W. H., . . . Topp, E. (2013). The scourge of antibiotic resistance: the important role of the environment. *Clin Infect Dis, 57*(5), 704-710. doi:10.1093/cid/cit355

Govt., B. (2016). *National Drug policy_2016*. Retrieved from www.dgda.gov.bd/index.php/laws-and-policies/261-national-drug-policy-2016.../file

Grigoryan, L., Burgerhof, J. G., Degener, J. E., Deschepper, R., Lundborg, C. S., Monnet, D. L., . . . Haaijer-Ruskamp, F. M. (2007). Attitudes, beliefs and knowledge concerning antibiotic use and self-medication: a comparative European study. *Pharmacoepidemiol Drug Saf, 16*(11), 1234-1243. doi:10.1002/pds.1479

Gu, J., Zhao, J., Huang, Y., Yang, W., Ren, Z., Li, W., . . . Fu, Y. (2015). Use of antibiotics by urban and rural residents in Heilongjiang Province, China: cross-sectional study. *Trop Med Int Health, 20*(12), 1815-1822. doi:10.1111/tmi.12602

Hogberg, L. D., Muller, A., Zorzet, A., Monnet, D. L., & Cars, O. (2014). Antibiotic use worldwide. *Lancet Infect Dis, 14*(12), 1179-1180. doi:10.1016/s1473-3099(14)70987-9

Holmes, A. H., Moore, L. S., Sundsfjord, A., Steinbakk, M., Regmi, S., Karkey, A., . . . Piddock, L. J. (2016). Understanding the mechanisms and drivers of antimicrobial resistance. *Lancet, 387*(10014), 176-187. doi:10.1016/s0140-6736(15)00473-0

International Medical Services. Retrieved from https://www.bangkokhospital.com/index.php/en/center-of-excellence/good-health/good-health_centers_11[18/1/2562

J Hu, Z. W. (2014). Bringing Antibiotics From Overseas And Self-Medication Amongst Australian Chinese Migrants. *The Internet Journal of Infectious Diseases, 14*(1). doi:10.5580/IJID.20324

Kaliyaperumal, K. (2004). Guideline for Conducting a Knowledge, Attitude and Practice (KAP) Study. *vol-4*(1).

Kanjanachaya Sirijoti1, Prathurng Hongsranagon2, *, Piyalamporn Havanond2, Wattana Pannoi1. (2014). ASSESSMENT OF KNOWLEDGE ATTITUDES AND PRACTICES REGARDING ANTIBIOTIC USE IN TRANG PROVINCE, THAILAND.

Kim, S. S., Moon, S., & Kim, E. J. (2011). Public knowledge and attitudes regarding antibiotic use in South Korea. *J Korean Acad Nurs, 41*(6), 742-749. doi:10.4040/jkan.2011.41.6.742

Kuenzli, E. (2016). Antibiotic resistance and international travel: Causes and consequences. *Travel Med Infect Dis, 14*(6), 595-598. doi:10.1016/j.tmaid.2016.11.010

Kulkarni, P., Gadekar, S., Mahajan, A., Ajmera, A., Garg, A., & Kulkarni, P. (2018). Global Scenario of Self Medication: A Review of Literature. *Indian Journal of Commerce & Management Studies, 9*(1). doi:10.18843/ijcms/v9i1/14

Kumar Bishwajit Sutradhar1, A. S., Naz Hasan Huda1, and Riaz Uddin1*. (2014). Irrational Use of Antibiotics and Antibiotic Resistance in Southern Rural Bangladesh: Perspectives from Both the Physicians and Patients. *ScienceDomain International*.

Ling Oh, A., Hassali, M. A., Al-Haddad, M. S., Syed Sulaiman, S. A., Shafie, A. A., & Awaisu, A. (2011). Public knowledge and attitudes towards antibiotic usage: a cross-sectional study among the general public in the state of Penang, Malaysia. *J Infect Dev Ctries, 5*(5), 338-347.

Mazinska, B., Struzycka, I., & Hryniewicz, W. (2017). Surveys of public knowledge and attitudes with regard to antibiotics in Poland: Did the European Antibiotic Awareness Day campaigns change attitudes? *PLoS One, 12*(2), e0172146. doi:10.1371/journal.pone.0172146

Mohamed Irfadh Mohamed Azhar 1, K. G., Amudha Kadirvelu 3, Sunil Gurtu 3, Sivalal Sadasivan 3, Bharti Madanlal Kshatriya 3. (2013). Self-medication: Awareness and Attitude among Malaysian Urban Population. *International Journal of Collaborative Research on Internal Medicine & Public Health, 5*(6).

Monitor, b. (2018). The Bangladesh Monitor - Bangkok Hospital is always ahead of others. Retrieved from https://bangladeshmonitor.com/tourism/141/Bangkok-Hospital-is-always-ahead-of-others[18/1/2562

Mukharjee, S. K., Mahmud, I., Akter, S., & Hossain, S. (2017). Knowledge, Attitudes and Practices Regarding Antibiotic Use among the Students of Microbiology Department at Noakhali Science and Technology University, Bangladesh. *Journal of Drug Delivery and Therapeutics, 7*(4). doi:10.22270/jddt.v7i4.1456

Munita, J. M., & Arias, C. A. (2016). Mechanisms of Antibiotic Resistance. *Microbiol Spectr, 4*(2). doi:10.1128/microbiolspec.VMBF-0016-2015

Napolitano, F., Izzo, M. T., Di Giuseppe, G., & Angelillo, I. F. (2013). Public knowledge, attitudes, and experience regarding the use of antibiotics in Italy. *PLoS One, 8*(12), e84177. doi:10.1371/journal.pone.0084177

Noree, T., Hanefeld, J., & Smith, R. (2016). Medical tourism in Thailand: a cross-sectional study. *Bull World Health Organ, 94*(1), 30-36. doi:10.2471/blt.14.152165

Rahman, M. S., & Huda, S. (2014). Antimicrobial resistance and related issues: An overview of Bangladesh situation. *Bangladesh Journal of Pharmacology, 9*(2). doi:10.3329/bjp.v9i2.18831

Rattanaumpawan, P., Boonyasiri, A., Vong, S., & Thamlikitkul, V. (2018). Systematic review of electronic surveillance of infectious diseases with emphasis on antimicrobial resistance surveillance in resource-limited settings. *Am J Infect Control, 46*(2), 139-146. doi:10.1016/j.ajic.2017.08.006

Richardson, L. A. (2017). Understanding and overcoming antibiotic resistance. *PLoS Biol, 15*(8), e2003775. doi:10.1371/journal.pbio.2003775

Saha, S. K. (2017). Factors Influencing Clinician's Antibiotic Prescribing Behaviors (APB) in Bangladesh: An In-Depth Review Using COMB Model. *Open Access Journal of Translational Medicine & Research, 1*(4). doi:10.15406/oajtmr.2017.01.00019

Scaioli, G., Gualano, M. R., Gili, R., Masucci, S., Bert, F., & Siliquini, R. (2015). Antibiotic use: a cross-sectional survey assessing the knowledge, attitudes and practices amongst students of a school of medicine in Italy. *PLoS One, 10*(4), e0122476. doi:10.1371/journal.pone.0122476

Selvaraj, K., Kumar, S. G., & Ramalingam, A. (2014). Prevalence of self-medication practices and its associated factors in Urban Puducherry, India. *Perspect Clin Res, 5*(1), 32-36. doi:10.4103/2229-3485.124569

Shaikhan, F., Rawaf, S., Majeed, A., & Hassounah, S. (2018). Knowledge, attitude, perception and practice regarding antimicrobial use in upper respiratory tract infections in Qatar: a systematic review. *JRSM Open, 9*(9), 2054270418774971. doi:10.1177/2054270418774971

Soma, L. J., Shahriar, M., Narjish, S. N., & Bhuiyan, M. A. (2015). Antimicrobial resistance pattern of Bacteria isolated from ICU patients with respiratory tract infections. *Dhaka University Journal of Pharmaceutical Sciences, 13*(2). doi:10.3329/dujps.v13i2.21900

Sutthiruk, N., Considine, J., Hutchinson, A., Driscoll, A., Malathum, K., & Botti, M. (2018). Thai clinicians' attitudes toward antimicrobial stewardship programs. *Am J Infect Control, 46*(4), 425-430. doi:10.1016/j.ajic.2017.09.022

Tangcharoensathien, V., Sommanustweechai, A., Chanvatik, S., Kosiyaporn, H., & Tisocki, K. (2018). Addressing the threat of antibiotic resistance in Thailand: monitoring population knowledge and awareness. *WHO South East Asia J Public Health, 7*(2), 73-78. doi:10.4103/2224-3151.239417

Tribune, D. (2017). Bangladeshis flock to Indian, Thai hospitals in huge numbers *Dhaka tribune*. Retrieved from https://www.dhakatribune.com/feature/health-wellness/2017/11/30/doctor-trust-bangladesh

Uddin, M., Rahman, M., Hasan, M., Islam, M., Sarkar, M., Hasan, M., . . . Sardar, M. (2017). Survey on Antimicrobial Resistance: Reason behind the Misuse of

Antibiotics in Bangladesh. *Journal of Pharmaceutical Research International*, *18*(6), 1-8. doi:10.9734/jpri/2017/36672

Vallin, M., Polyzoi, M., Marrone, G., Rosales-Klintz, S., Tegmark Wisell, K., & Stalsby Lundborg, C. (2016). Knowledge and Attitudes towards Antibiotic Use and Resistance - A Latent Class Analysis of a Swedish Population-Based Sample. *PLoS One*, *11*(4), e0152160. doi:10.1371/journal.pone.0152160

WHO, W. h. o. (2008). *A guide to developing knowledge, attitude and practice surveys*. In.

WHO, W. H. O. (2014). *Antimicrobial resistance Global report on survillance*. Retrieved from https://www.who.int/drugresistance/documents/surveillancereport/en/

WHO, W. H. O. (2018a). Antibiotic resistance-WHO fact sheet.

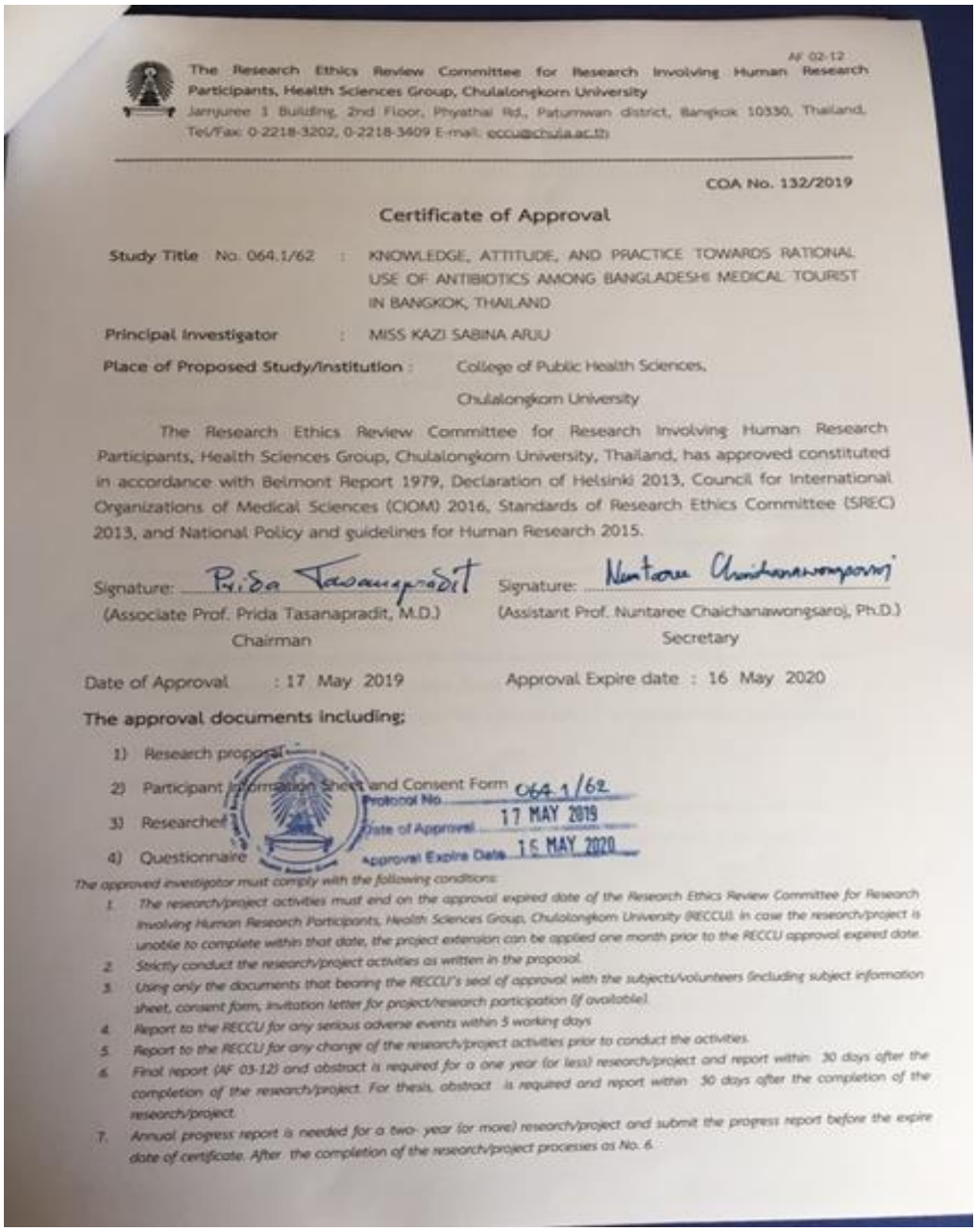
WHO, W. H. O. (2018b). WHO Antimicrobial resistance fact sheet ,2018.

Yasmin, R., Gyeltshen, T., & Islam, R. E. (2018). Knowledge, Attitude and Practice of Antibiotics Usage among patients attending OPD of a Dental College Hospital in Dhaka, Bangladesh. *Journal of Medicine*, *19*(2). doi:10.3329/jom.v19i2.37225

Zaman, S. B., Hussain, M. A., Nye, R., Mehta, V., Mamun, K. T., & Hossain, N. (2017). A Review on Antibiotic Resistance: Alarm Bells are Ringing. *Cureus*, *9*(6), e1403. doi:10.7759/cureus.1403

APPENDICES

Appendix A: Certificate of Approval



AF 02-12

The Research Ethics Review Committee for Research Involving Human Research Participants, Health Sciences Group, Chulalongkorn University

Jamjuree 1 Building, 2nd Floor, Phyathai Rd., Patumwan district, Bangkok 10330, Thailand.
Tel/Fax: 0-2218-3202, 0-2218-3609 E-mail: eccu@chula.ac.th

COA No. 132/2019

Certificate of Approval

Study Title No. 064.1/62 : KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARDS RATIONAL USE OF ANTIBIOTICS AMONG BANGLADESHI MEDICAL TOURIST IN BANGKOK, THAILAND

Principal Investigator : MISS KAZI SABINA ARJU

Place of Proposed Study/Institution : College of Public Health Sciences, Chulalongkorn University

The Research Ethics Review Committee for Research Involving Human Research Participants, Health Sciences Group, Chulalongkorn University, Thailand, has approved constituted in accordance with Belmont Report 1979, Declaration of Helsinki 2013, Council for International Organizations of Medical Sciences (CIOM) 2016, Standards of Research Ethics Committee (SREC) 2013, and National Policy and guidelines for Human Research 2015.

Signature: Prida Tasanapradit
(Associate Prof. Prida Tasanapradit, M.D.)
Chairman

Signature: Nuntaree Chaichanawongsaroj
(Assistant Prof. Nuntaree Chaichanawongsaroj, Ph.D.)
Secretary

Date of Approval : 17 May 2019 Approval Expire date : 16 May 2020

The approval documents including:

1) Research proposal
2) Participant Information Sheet and Consent Form
3) Researcher
4) Questionnaire

Protocol No. 064.1/62
Date of Approval 17 MAY 2019
Approval Expire Date 16 MAY 2020

The approved investigator must comply with the following conditions:

1. *The research/project activities must end on the approval expired date of the Research Ethics Review Committee for Research Involving Human Research Participants, Health Sciences Group, Chulalongkorn University (RECCU). In case the research/project is unable to complete within that date, the project extension can be applied one month prior to the RECCU approval expired date.*
2. *Strictly conduct the research/project activities as written in the proposal.*
3. *Using only the documents that bearing the RECCU's seal of approval with the subjects/volunteers (including subject information sheet, consent form, invitation letter for project/research participation (if available).*
4. *Report to the RECCU for any serious adverse events within 5 working days*
5. *Report to the RECCU for any change of the research/project activities prior to conduct the activities.*
6. *Final report (AF 03-12) and abstract is required for a one year (or less) research/project and report within 30 days after the completion of the research/project. For thesis, abstract is required and report within 30 days after the completion of the research/project.*
7. *Annual progress report is needed for a two- year (or more) research/project and submit the progress report before the expire date of certificate. After the completion of the research/project processes as No. 6.*

Appendix B : Participant Information Sheet

Title of Research: **KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS RATIONAL USE OF ANTIBIOTICS AMONG BANGLADESHI MEDICAL TOURIST IN BANGKOK, THAILAND**.

Name of Principal Researcher: Ms. Kazi Sabina Arju
Position: Master of Public Health Student
Contact Address: Brighton Place 38/158, Soi-soonvijai-6, Phetchburi Road, Bangkok, Thailand.

Telephone: 0888717818
Email: arju0137@gmail.com

1.Introduction

You are warmly being invited to participate in a research project. Before you decide to participate in research it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and do not hesitate to ask anything difficult to understand or if you want to know more about research. Moreover, you can decide freely whether you want to participate or not after reading this document and knowing information about the research, benefits and risks. You also have right to withdraw from the study at any time without giving any reason.

2.Contents of the survey question

The survey involves self administered structured questionnaire which consist of 4 parts such as socio-demographic factor, Knowledge about rational use of antibiotics, attitude towards rational use of antibiotics, practice regarding rational use of antibiotics using questionnaire containing total 87 questions.

3.Objectives of the research

Purpose of this study to determine the characteristics of Bangladeshi medical tourist and to assess the level of knowledge ,attitude and practice towards rational use of antibiotics among Bangladeshi medical tourist .

4.Participants Selection

In this study participants will be medical tourists in Bangkok who is visiting in Bangkok General Hospital. This study will need 380 participants. Participants who meet inclusion criteria and who do not meet the exclusion criteria will be involved in this study.

Inclusion Criteria	Exclusion Criteria

1.Bangladeshi Nationality, traveling to Thailand for medical treatment purpose. **2.** Adult patients above 18 years of age to max of 75 years of age both male and female and able to provide responses in the questionnaire form**.** 3. Taking treatment as OPD case. 4.Agree to participate in the study with informed written consent. 5.People who completed Higher secondary and higher.	1. People who are critically ill,e.g. can not response due to respiratory problem. 2. People who are incapable of responding to questionnaire due to mental health problem 3. Conflict language, not understand the questionnaire in English. 4. People who are medical professional-Physician 5.People who are not willing to participate in study 6. People who are Expat

5.Procedure of research

The list of participants will be selected according to daily appointment list from Bangladesh Medical Services in Bangkok General Hospital. Principal researcher and research assistant will go to Outpatient department with the help of hospital staff. People who meets inclusion criteria will request them to participants in study. If Participant agree Then, the principal researcher and research assistants explain about the information regarding the study and taking consent in both oral and written consent, data collection will be started by self administered structured questionnaire about the components that already mentioned above. Principal researcher and research assistants will help if there is any problem to understand questionnaire. Total time will be taken around 30- 35 minutes to complete questionnaire.

6.Procedure of taking consent

After the principal researcher and research assistants explain you regarding the study using participant information sheets, they will ask your will to participate in this study and they will take oral consent and written consent using informed consent form. If the participant willing to participate they can give written consent and sign in consent form. If you do not want to participate, you do not need to give consents and you do not need to give an explanation.

7.Benefits

The study will not give benefit directly to you as it provides the baseline information for institute and country to develop a policy regarding rational use of antibiotics and for the researcher to develop the further study. However, your participation will be beneficial for development of knowledge of other people of your country. As your participation is voluntary and no special compensation for participation in this study will be done. Nevertheless, the researcher will give you a small present such as pen or key rings as appreciation for your participation.

8.Risk/Harm

No risk and/or harm of any kind can be inflicted upon participants . You have to spend your time doing the research questionnaire around 30-35 minutes. You may refuse to answer any question or not take part in a portion of the interview if you feel the questions are personal or if you feel talking about them makes you uncomfortable.

9.Confidentiality

Any information that is linked to you will be kept confidentially. Even though the study will be published, your names or other identifying information will not be mentioned in the report or summaries of the study. The final report can be available from principal researcher and the report will not be used with another intension. The data will be kept confidentially during the process of report and research and all data files together with the participants' answer on questionnaires will be destroyed after final report has been done.

10.Right of participant

You have the right to choose or refuse for giving consent and participating in this study. Even after giving consent, you can withdraw from the study at any time. There will not be any bad consequence to you for this reason. You can also ask anything you want to know before, during and after the study conduct any time. You can contact the principal researcher with given address mentioned above or you can make report to the Research Ethics Review Committee, Chulalongkorn University (RECCU)., Jamjuree 1 Bldg., 2nd floor., 254 Phayathai Road., Pathuwam District, Bangkok 10330, Thailand, Tel/Fax +662218-3202 E-mail: eccu@chula.ac.th at any time if you have any questions or complaints about this study or the researcher does not treat the participant according to the indications above.

Appendix C: Informed consent form

The code number of participant …….

I who have signed here below do agree to participate in this research project.
Title: **" KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS RATIONAL USE OF ANTIBIOTICS AMONG BANGLADESHI MEDICAL TOURIST IN BANGKOK, THAILAND"**

Name of Principal Researcher: Ms. Kazi Sabina Arju
Contact Address: Brighton Place 38/158, Soi-soonvijai-6, Phetchburi Road, Bangkok, Thailand.
Telephone: 0888717818

I have read or been informed in details about the rationale and objectives of this research study what I will be engaged with, risk and benefits of the study and the rights of the participants. I have already received the contact details of the principal researcher. I have been explained by the researcher in information sheet and I clearly understand with satisfaction.

I am willing to participate in this research and to response the questionnaires which are focusing on socio-demographic factors, knowledge , attitude and practice towards rational use of antibiotics. I am acknowledged that I might feel not being comfortable in answering the questions which are included in this research questionnaire. I have been informed that to complete questionnaire will take about 30-35minutes, and will be done only 1 time.

I have my right to withdraw from this study at any time if I wish and I would not need to give any reason for withdrawal. This withdrawal will not have any negative impact on me. The researcher has guaranteed that procedures acting upon me would be exactly the same as identified in participant information sheet. All personal information about me will be kept in confidential and the questionnaires will be destroyed after final report has been done. Results of the study will be described by using the overall picture. Any of personal information which could be able to identify me will not be described in the report.

If I am not treated as mentioned in the participant information sheet, I have known that I can report to the Research Ethics Review Committee for Research Involving Human Research Participants, Health Sciences Group, Chulalongkorn University (CCU). Jamjuree 1 Bldg., 2nd floor, 254 Phayathai Road, Pathumwan district, Bangkok 10330, Thailand, Tel./ax, +66-2218-3202 email: eccu@chula.ac.th.

I have read the information in this consent form, or it has been read to me. Furthermore, I have received a copy of participant's information sheet and informed consent form.

Researcher's Name …… Participant's Name ……

Signature of researcher …… Signature of participant ……

Signature of Adviser……..

Date ___/ ___/ ___/
(Day /month /year)

Date ___/ ___/ ___/
(Day /month /year)

Appendix D: Self-administered Questionnaires

QUESTIONNAIRES ON "KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS RATIONAL USE OF ANTIBIOTICS AMONG BANGLADESHI MEDICAL TOURIST IN BANGKOK, THAILAND"

Respondents Number…….
Date…….

Please write or give a tick to complete required field as follows:

Part 1: Sociodemographic factors	**For Researchers**
1.Sex ☐ 1.Male ☐ 2.Female	
2.Age …….years old	
3.Religion **☐ 1.Islam ☐ 2.Hindu ☐ 3.Buddist ☐ 4.Christian ☐ 5.Others(Specify)…….**	
4.Marital status **☐ 1.Single ☐ 2.Married ☐ 3.Widowed ☐ 4.Seperated/Divorced**	
5.Education **☐ 1. Below primary level ☐ 2.Primary school ☐ 3. Secondary school ☐ 4. Higher secondary ☐ 5. Bachelor degree ☐ 6.Masters degree and above**	
6.Occupation **☐ 1.Business ☐ 2. Service ☐ 3.Govt. officer ☐ 4.Students ☐ 5.Others (Specify)…….**	
7.Monthly income …… $/months (Please put the approximate figures, not range)	
8.Family member related with health profession ☐ Yes ☐ No	

9. Department of taking treatment…….	
10. Antibiotic use within last 1 year ☐ Yes ☐ No	
11.Current use of any other medication ☐ Yes ☐ No	
12. Comorbid disease- ☐ 1.Diabetes mellitus ☐2.Peptic Ulcer ☐3.Hypertension **☐4.Dyslipidemia ☐5.Asthma ☐6.Chronic kidney disease** ☐7.Allergy ☐8.Anemia ☐9.Headache ☐10.None	

PART 2 : Knowledge about rational use of antibiotics

Please give a tick in the column best fits your opinion

1. **"True" means statement is correct**
2. **"False" means statement is incorrect**
3. **If you are not sure, can answer "do not know"**

no	Statement	True	False	Do not know	Code (do not fill)
1	Amoxicillin/penicillin is an antibiotic.				
2*	Aspirin is an antibiotic.				
3*	Paracetamol is an antibiotic.				
4	Antibiotic are useful for bacterial infection.				
5*	Antibiotic are useful for viral infection like flu.				
6*	Antibiotic are useful for both bacterial and viral infection.				

7*	**Antibiotic are same as anti-inflammatory agents e.g. paracetamol.**				
8	**Antibiotic can causes side effects such as nausea, vomiting, diarrhea.**				
9	**Antibiotic can causes allergic reactions such as rash in body, swollen lip and eye, palpitation, breathing difficulty.**				
10	**Antibiotic can cause secondary infections after killing good bacteria present in our body.**				
11	**Bacterial infection can spread through contact with person who has infection.**				
12	**Bacterial infection can spread through contact with animal, food, or water carrying antibiotic resistance Bacteria.**				
13	**Misuse of antibiotic can lead to antibiotic resistance.**				
14	**The more antibiotic we use in society , the higher the risk of resistance development and spreads.**				
15	**Bacteria can become resistant to antibiotics.**				
16	**Unfinished antibiotics dose is the cause for bacterial resistance.**				

17	**If someone have antibiotic resistant he can not use same medicine for infection treatment.**				
18	**One must take all antibiotic doses until finish the recommended course by physician.**				
19*	**Unfinished antibiotic can be store for future use.**				
20	**One should not use hot water to dissolve pediatric antibiotics, because hot water can destroy efficacy of antibiotics.**				
21	**Heat and direct sunlight can damage antibiotics.**				

PART 3 : Attitude towards rational use of antibiotics

Please give a tick in the column best fit to your opinion

No	Statement	Strongly agree	Agree	Not sure	Disagree	Strongly disagree	Code(do not Fill)
1	**I think one should buy antibiotics with physician prescription.**						
2*	**I think that it is good to be able to buy antibiotics without seeing a physician.**						

3*	**I think it is good that one can buy antibiotic without prescription in pharmacies.**						
4	**I know which medicines are the antibiotics when I take cold medicine.**						
5*	**I prefer to take same antibiotics that worked before because it helps save more money.**						
6*	**I prefer to buy same antibiotics that worked before because it helps save time to visit hospital.**						
7*	**Antibiotics make one recover faster**						

	when having a cold.						
8*	**If one's mucous changed color when having a cold i.e. clear to yellowish or greenish , always need antibiotics to get rid of the cold.**						
9*	**I prefer antibiotic injections to recover from infection faster.**						
10*	**I would stop taking the prescribed antibiotics if I got better.**						
11*	**I take left-over antibiotics when I have similar flu symptoms.**						

12*	**Leftover antibiotics can be saved for personal future use or to give someone else.**						
13	**Leftover antibiotics should be taken back to the pharmacy.**						
14	**The body can usually fight mild infections on its own without antibiotics.**						
15	**If I get an infection I often wait and see whether infection goes away on its own.**						
16	**A persistent cough (longer than one week) always need to be treated with**						

	antibiotics to disappear.						
17*	**It is appropriate to take antibiotics when having a sorethroat and a cold, otherwise one may suffer complications.**						
18	**It is appropriate to take antibiotics for tonsillitis, otherwise one may suffer complications.**						
19*	**An ear infection in a 3-6 years old child always need to be treated with antibiotics.**						
20*	**I think one should share their leftover antibiotics with their friends.**						

21*	**I change physician if physician does not prescribe antibiotics.**						
22*	**I think hot water dissolve pediatric antibiotics dry powder well and increase efficacy of the medicine.**						

PART 4 : Practice regarding rational use of antibiotics

Please give a tick in the column best fit your opinion

No	Statement	usually	sometimes	never	Code(do not fill)
1*	**I take antibiotics every time that I start to feel unwell.**				
2*	**I search for leftover antibiotics in my house to use.**				
3*	**I request doctor or healthcare professional to give antibiotic injection for relieving illness.**				
4*	**I buy antibiotics by telling trade name I prefer.**				

5*	**I buy antibiotics by bringing old antibiotics packaging or the sample of used antibiotics previously used.**				
6*	**I buy antibiotics by suggestions from friends and family members.**				
7*	**I buy antibiotics by suggestions from advertisement in television, radio, newspaper and internet.**				
8*	**I distribute antibiotics that make my illness better to other person who have the same symptom.**				
9*	**I stop taking antibiotics as soon as symptoms are relieved.**				
10*	**I keep stock some antibiotics at home in case emergency.**				
11*	**I usually ask physician to prescribe antibiotics.**				
12	**I follow all the instructions of the physician when using antibiotics.**				
13*	**I ask pharmacist to suggest antibiotics.**				

14	**I trust physician decision when deciding no to prescribing antibiotics.**				
15	**Antibiotics should be administered with a prescription.**				
16*	**I change physician for not prescribing antibiotics.**				
17*	**I ask friends and family to buy antibiotics for me.**				
18*	**I take antibiotics without looking label of information on sachet or packaging.**				
19	**I read label of information, medicine name, indications before taking antibiotics.**				
20	**I check for manufacturing date and expiry date before taking antibiotics.**				
21	**I do not take food or drink while taking antibiotics.**				
22*	**I increase antibiotics dose by myself to recover faster.**				
23*	**I increase antibiotics dose if symptoms not getting better.**				

24*	**I dissolve antibiotics tablets/capsules in water before taking.**				
25*	**If I forget to take dose of antibiotics, next time I will take double dose by myself.**				
26	**I observe for allergic symptom such as rash, swelling, nausea, vomiting or breathing difficulty, after taking antibiotics.**				
27*	**I store antibiotics in kitchen.**				
28*	**I store antibiotics in refrigerator.**				
29	**I store antibiotics in cool and dry place.**				

"THANK YOU FOR PARTICIPATING"

Appendix E: Administration and Time schedule

Research activities		Time frame (year 2018-2019)							
	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019	Apr 2019	May 2019	June 2019	July 2019
Review of Related literature									
Proposal writing and submission									
Proposal Examination and Ethical Consideration									
Field preparation and Data collection									
Data analysis and Report writing									
Thesis Examination									
Thesis and article submission									

Appendix F: Budget

Budget list	Price per unit	Quantity	Total price(Baht)
Photocopy,Books,literature, Questionnaire, Thesis paper	1.00	5000	5000
Payment for research assistants	5000	2	10000
Gift for participants	13.8	362	5000
Stationary, pen etc	-	-	1000
Travelling cost	-	-	5000
Miscellaneous	-	-	5000
Total(Baht)			31000

VITA

NAME	Kazi Sabina Arju
DATE OF BIRTH	10 October 1983
PLACE OF BIRTH	Chittagong,Bangladesh
INSTITUTIONS ATTENDED	Rangpur Medical College, Rajshahi University
HOME ADDRESS	Chittagong, Bangladesh.