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Antibiotics self-medication practices among health care professionals in selected public hospitals in Addis Ababa

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Addis Ababa, Ethiopia

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A thesis submitted to the Department of Pharmaceutics and Social Pharmacy in partial fulfillment of the requirements for the Degree of Master of Science in Pharmacoepidemiology and Social Pharmacy

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School of Graduate Studies

This is to certify that the thesis prepared by Tsehay Kassa, entitled "Antibiotics self-medication practices among health care professionals in selected public hospitals of Addis Ababa" and submitted in partial fulfillment of the requirements for the Degree of Master of Science in Pharmacoepidemiology and Social Pharmacy complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Abstract

Introduction*: Self-medication is the first option and response to most illness episodes. Use of antimicrobials without health care professionals' guidance may result in greater probability of inappropriate, missed diagnosis, delays in appropriate treatment, pathogen resistance and increased morbidity. There is no sector in the health care community which is immune to drug abuse or misuse of which the worst offenders include Physicians, Nurses and Pharmacists. Self-medication among health care professionals may be an indicator that the health professional is neglecting his or her own health. This is important because the health habits and attitudes of health care professionals influence the counseling and care they provide to patients.*

Objective*: This study was conducted to assess the prevalence of self-medication practices of antibiotics and factors associated with it among health care professionals in selected hospitals of Addis Ababa.*

Methods*: Cross-sectional survey using self-administered questionnaires was employed to collect information from health professionals working in hospitals which were selected by using simple random sampling method. Data were collected from April to May, 2017.*

Results*: A total of 317 respondents participated in this study. The prevalence of self-medication using antibiotics among health care professionals in one month recall period was found to be 72 (22.7%). The main reasons given for this were being familiar with the treatment options 31 (37%) , to get quick relief 25 (30%), lack of time. Respiratory problems accounted for self-medication 29 (40.3%) followed by gastro intestinal problems 28 (38.9%) were the two most common perceived illnesses for self-medication with antibiotics. Penicillins 30 (42%) and Fluroquinolones 29 (40%) were the most commonly used antibiotics for self-medication. None of the variables had significant association with the practice of self-medication with antibiotics.*

Conclusions and Recommendations*: Overall, the prevalence of self-medication using antibiotics among health care professionals was high, which might contribute for the increasing antibiotic resistance. Therefore, the regulatory body should strictly regulate the sale of antibiotics without prescription. Regular short term training for all health care professionals on antibiotic self-medication and the consequences of antimicrobial resistance should be done to curb these practices.*

Key words*: Self-medication, Antibiotics, Health Care Professionals*

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List of Abbreviations

AACHB	Addis Ababa City Health Bureau
AMR	Antimicrobial resistance
AOR	Adjusted Odds Ratio
CI	Confidence Interval
COR	Crude Odds Ratio
CSA	Central Statistics Agency
DACA	Drug Administration and Control Authority
ETB	Ethiopian Birr
FMOH	Federal Ministry of Health
HCP	Health Care Professional
MSH	Management Science for Health
OTC	Over the Counter
SMA	Self Medication with Antibiotics
SPSS	Statistical Package for Social Science
WHO	World Health Organization

1. Introduction

1.1. Background

The World Health Organization (WHO) defined self-medication as the selection and use of medicines by individuals to treat self-recognized illnesses or symptoms (WHO, 1998). Self-medication is practiced around the world, although there has been restriction and effective control in some developed countries (Arikpo *et al*., 2009). Lack of access to health care, being a lower cost alternative; availability of many medicines Over The Counter (OTC) without medical supervision and poor drug regulatory practices are some of the reasons for its commonness in many countries (Vaananen *et al*., 2006).

Although responsible self-medication is not discouraged, there are potential risks related to self-medication practices. Some of these are misdiagnosis, over dosage, prolonged exposure to medicines, medicines interactions, poly-pharmacy, risk of dependence, risk of abuse which may lead to toxicity and pharmacological risks associated with improper use of medicines (Gholap and Mohite, 2013; Khan *et al*., 2014; WHO, 2000a).

The patterns of self-medication vary among different population and are usually influenced by many factors. These include, age, gender, income, level of education, medical knowledge, availability of medicines, exposure to advertisements and perception of illnesses (Martins *et al.,* 2002). Self-medication is much more common among physicians, nurses, pharmacists and medical students than among the general population in United Arab Emirate (Sharif *et al*., 2015). There is no sector in the health care community which is immune to medicine abuse or misuse of which; the worst offenders include physicians and pharmacists. Study in Malaysia reveled that they are considered to be the worst offenders as they have an easy access to medications, have medical background and high self-confidence (Ali *et al*., 2012). Self-medication with antibiotics constitutes a major form of irrational use of medicine (Goossens *et al*., 2005).

Despite public awareness and concern of Health Care Professionals (HCPs) improved, global irrational use of antibiotics is highly increased (Filho *et al*., 2004; Gaash, 2008; Zafar *et al*., 2008). Irrational use of antimicrobials without medical guidance may result in greater probability of inappropriate, incorrect, or undue therapy, missed diagnosis, delays in appropriate treatment, pathogen resistance and increased morbidity (Matuz *et al*., 2007; Parimi *et al*., 2004).

The use of antibiotics without prescription is motivated by a complex set of factors. Unchecked sales, economic and time constrains, influence of family and friends, consumer attitudes and expectations and media campaigns are some of the reasons (Abay and Amelo, 2010; Kristiansson *et al*., 2008; Reisrocha *et al*., 2009). The emergence of Antimicrobial resistance (AMR) threatens the control of infectious diseases and is a major public health concern (WHO, 2014). The emergence of human pathogen resistance to antibiotics, both due to over and under use, is potentially dangerous for both individuals and societies (Kristiansson *et al*., 2008).

The consequences of inappropriate self-medication among HCPs have severe implications including legal, ethical, health defects, negative impacts on patient and quality of health care delivery (Ali *et al*., 2012). Assessing Self-medication with Antibiotics (SMA) among HCPs is important as their health habits and attitudes influence the counseling and care they provide to patients. It also shows to what extent HCPs comply with ethical rules in seeking help when they get ill (Hem *et al*., 2005).

1.2. Statement of the problem

Although self-medication practice has unquestionable benefits, there are undesired outcomes that occur due to improper usage (Sleath *et al*., 2001). These are increased resistance of pathogens, adverse reaction, delayed diagnosis, delayed treatment which may lead to prolonged suffering, possibly fatal consequence and wastage of resources (Bennadi, 2014; Sarahroodi, 2012). In developing countries self-medication usually leads to inadequate medicine use and is especially worrying when it involves prescription medicine such as antibiotics (Hussain *et al*., 2011).

Problems related to SMA particularly in the developing world are complex as they are linked to other issues such as poverty, lack of access to medicines and information regarding medicines, poor quality of health care facilities and weak implementation of regulation related to medicines (Widayati *et al*., 2011). The consequences of SMA are severe; infections caused by resistant microbes fail to respond to treatment, resulting in prolonged illness and greater risk of death. Treatment failures also lead to longer periods of infectivity which increase the numbers of infected people moving in the community and thus expose the general population to the risk of contracting a resistant strain of bacteria (Abasaeed *et al*., 2009).

Despite knowing the consequences and potential risks of medicines, the prevalence of self-medication practices is high among HCPs. Several studies revealed that the prevalence of self-medication practice among HCPs ranges between 24% to 96% (Ali *et al*., 2012 ; Gholap and Mohite, 2013; Harris *et al*., 2013; Hem *et al*., 2005; Pankaj *et al*., 2015). Most often HCPs find it difficult to enter in to the patient role due to various reasons such as restricted time, nature of illness, high drug knowledge, concerns about confidentiality, high ego and ease of access to medications (Ali *et al*., 2012).

Self-medication by physicians and medical students represent serious issues for both patients and physicians. For the physician, there is an obvious threat to their health of inappropriate subjective or delayed objective treatment. For the patient, a physician whose health is impaired is at risk of not being able to deliver care of the expected quality (Montgomery *et al*., 2011).

In Ethiopia, there are indications on the misuse of antibiotics by HCPs, unskilled practitioners and drug consumers coupled with rapid spread of resistant bacteria (DACA and MSH, 2009). Moreover, literature and the practice showed that most antibiotics are easily available as OTC medicines in most retail pharmacies (Beedemariam and Kaba, 2016). Some studies were conducted on self-medication practice among the general population in different parts of Ethiopia which shows prevalence ranging from 27.6% to 77.1% (Abrha *et al*., 2014; Adugna *et al*., 2016; Belachew *et al*., 2011; Sado and Gedif, 2014; Worku and G/Mariam, 2003). Since HCPs have knowledge about medicines; they might be expected to behave differently than the general population.

Even though there is malpractice of SMA among HCPs in health facilities, there was limited study addressing the issue. This study was therefore aimed at assessing SMA practice among HCPs in Addis Ababa, Ethiopia. In the context of this study HCPs refers to those health care providers which consists only Physicians, Nurses and Pharmacy Professionals. Knowing the prevalence and determinants of self-medication practice among HCPs is important to devise appropriate regulatory and administrative measures in the hospitals of Addis Ababa in particular and the country in general.

2. Literature review

2.1. Self-medication

Self-medication is defined as the use of medicines by the consumer to treat self recognized disorders or symptoms, or the intermittent or continued use of a medication prescribed by a physician for chronic or recurring disease or symptoms (WHO, 2000b). Taking non-prescription medicines is the initial response in almost half of all illness episodes, particularly for symptoms viewed as non-serious (Lau *et al*., 2000). At this point it is important to note that the nature and extent of self-medication varies in different cultural contexts. Moreover, social and educational influences may be greater than the influence of medical practice (Sharma *et al*., 2005).

2.2. Advantages and disadvantages of self-medication

Self-medication provides advantages for people who self-medicate, pharmaceutical manufacturers, health professionals, governments and health insurers (Silvo, 2000). The benefits of self-medication is that it is voluntarily chosen by consumers for conditions when it is preferable to them; selected for use in symptoms and conditions which the user regards as sufficiently troublesome to need medicinal treatment but not to justify consulting a physician; lowering the cost of community funded health care programmes (including prescription reimbursement systems) and wider availability of medicines; greater choice of treatment; direct, rapid access to treatment; an active role in his or her own health care; educational opportunities on specific health issues; convenience; economy, particularly since medical consultations will be reduced or avoided (WHO, 2000b). It also provides saving scarce medical resources from being wasted on minor conditions, reducing absenteeism from work due to minor symptoms, self-reliance in preventing or relieving minor symptoms and a positive contribution to primary health care and it also free up physician time for more serious conditions and travel related costs are reduced (Sarahroodi, 2012).

Self-medication has a number of potential risks. In particular, the ordinary user will usually have no specialized knowledge of the principles of pharmacology or therapy or the specific characteristics of the medicinal product used. This results in certain potential risks for the individual consumer: incorrect self-diagnosis, inadequate or excessive dosage, failure to seek

appropriate medical advice promptly, incorrect choice of therapy, failure to recognize special pharmacological risks, rare but severe adverse effects, failure to recognize contraindication, food and drug interaction, warning and precautions, risks of dependence and abuse (WHO, 2000b).

2.3. The use of antibiotics for self-medication

Worldwide, the place of antibiotics in the classification of medicines (Prescription and non prescription/OTC) differs from country to country. There are various regulations regarding access to antibiotics. For example In Turkey, there is no law restricting the purchase of antibiotics without prescription (IIlhan *et al*., 2009). Conversely, regulation mandates an appropriate prescription to purchase antibiotics in most other countries (Awad *et al*., 2005; AL-Bakri, 2005; Grigorian, 2007, DACA and MSH, 2009).

The sale of antibiotics without prescription is also observed in many countries. The practice is more pronounced in developing and low income countries where legislations and regulations are weak (Akinyandenu and Akinyandenu, 2014). In these countries antibiotics are illegally purchased without medical prescriptions and very little effort has been made to tackle this public health issue (Lowe and Montagu, 2009). Non-prescription sale of antibiotics is a crisis that has received very minimal audience despite its long practice (Akinyandenu and Akinyandenu, 2014). In Ethiopia, OTC sale of antibiotics at partial doses and without prescription are common practices, although the practice is illegal (Beedemariam and Kaba, 2016).

2.4. Prevalence of SMA

SMA is a global problem; the prevalence rates are high all over the world, up to 68% in 20 European countries (Bretagne *et al*., 2006). According to a study in Lithuania, one-quarter (24.9%) of respondents claimed that they had used SMA, despite the national regulation that strictly defines antibiotics as prescription-only medicines (Pavyde *et al*., 2015). The overall prevalence of SMA in Middle East countries was shown to range between 19%-82%. A high prevalence was reported in Yemen, Oman, Saudi Arabia, United Arab Emirates, Syria, Iran, Jordan, and Lebanon followed by Turkey (Alhomoud *et al*., 2017). In a survey conducted on Mongolian children, 42.3% of the children used non-prescribed antibiotics for symptoms of upper respiratory tract infection such as cough, fever or nasal and throat symptoms (Togoobaatar

et al., 2010). Much higher prevalence was found in Kuwait (92%) and in Karachi (47.6%) (Abahussain *et al*., 2005; Jawad *et al.*, 2014).

Several studies revealed that increased SMA in developing countries was due to a number of factors. These included socioeconomic factors, medical knowledge, lifestyle, over-the-counter sale of antibiotics, the cost of medical consultation, low satisfaction with medical practitioners and misconceptions regarding the efficacy of antibiotics (Abay and Amelo, 2010; Grigoryan *et al*., 2008; Radyowijati and Haak, 2003; Saradamma *et al.,* 2000).

Findings in Africa showed that SMA was a common practice and the following percentages were reported. In Kenya SMA prevalence rate among adult patients was 48% (Kiragu *et al.*, 2016) and it was 38.6% in Nigeria (Tamuno and Mohammed, 2011). Higher prevalence was also observed in Sudan with SMA prevalence of 73.9%. As a result minor ailments are often treated with antimicrobials without health professional's consultation (Awad *et al*., 2005). In addition, in Ethiopia studies done in Mekelle University students showed that 44.5% of students practiced SMA (Eticha *et al*., 2014). Moreover, studies at Bahir Dar and Addis Ababa also showed that 18% and 26.4% of respondents had self-medicated with antibiotics respectively (Andualem and Gebre-Mariam, 2004; Gebeyehu *et al*., 2015).

2.5. Self-medication among HCPs

Physicians and medical students find it challenging to be a patient as a result of their medical training and attitudes and are often regarded as reluctant or even difficult patients by HCPs who treat them. Medical students usually seek informal care paths; they request and receive informal care from friends and colleagues. This problem starts early as significant proportions of medical students feel it is appropriate for doctors to self-investigate, self-refer and self-medicate (Montgomery *et al*., 2011).

Nursing workers, who often have more than one job, coupled with the complex work performed at hospitals, leads to the conclusion that these professionals might face difficult moments or crises, making the consumption of medications a way to facilitate their lives (Reisrocha *et al*., 2009). Pharmacists have the greatest access to medications and also have adequate knowledge of

prescription and OTC drugs and their use in the treatment of various conditions. These factors increase the potential of self-medication (Balbisi and Ambizas, 2005).

The most common class of medicines that were used among HCPs in different countries were analgesics, anti-pyretics, antibiotics, anti-inflammatory, anti-histamines, anti-acids, vitamins and minerals, anti-fungals, nasal or ear/eye drops, laxatives, sedatives, oral contraceptives and anti-hypertensives (Gholap and Mohite, 2013; Harris *et al*., 2013; Hem *et al*., 2005; Nalini, 2010; Pankaj *et al*., 2015). In all of these studies, more than 50% of HCPs practice SMA. However, the prevalence of SMA among HCPs in Ethiopia is not yet known.

2.6. Predisposing factors for self-medication among HCPs

Many HCPs find it difficult to enter the patient role (role reversal) for various individual and organizational reasons such as time pressure, the stigmatizing nature of sickness, worries about bothering or letting down colleagues, fear of showing weakness, better knowledge, easy access to medicines, ease and convenience, exposure to advertisements, concerns about confidentiality and quick relief (Gholap and Mohite, 2013; Kay *et al*., 2008; Pankaj *et al*., 2015; Thompson *et al*., 2001).

2.7. Common types of perceived illnesses/symptoms treated with SMA

Several studies in Europe and United States of America have shown considerable practice of SMA and the most common indications were upper respiratory tract problems such as common cold which are self-limiting and mostly caused by viruses (Gregorian *et al*., 2008; Pan *et al*., 2012). Sore throat, fever and respiratory problems such as common cold and cough were the most common indications for SMA in Middle East countries in addition to gastro-intestinal, genito-urinary, oral and skin problems (Alhomoud *et al*., 2017).

Studies in African countries such as in Ghana and Nigeria showed that cough, common cold, influenza and digestive disorders were the most frequently reported health problems for SMA (Donkor *et al*., 2012; Fadare and Tamuno, 2011). Moreover, study in Ethiopia such as Mekele University showed that the majority of ailments for which the students used SMA were common cold, headache, cough, abdominal pain and fever (Eticha *et al*., 2014).

2.8. Commonly used antibiotics for self-medication

Irrational drug use especially SMA practice is common all over the world (Phalke and Durgawale, 2006). There are existing similarities in the antibiotics used for self-medication across different countries. Studies in Asia revealed that Penicillins were the most widely used antibiotic for self-medication. For instance, findings of Iranian students revealed that 81% of medical and 91.5% of non-medical respondents used antibiotics of Penicillin groups. Among Penicillin's group Amoxicillin was the most frequently used for self-medication (40.5% for medicals and 74.3% for non-medical students (Sarahroodi *et al*., 2010). Furthermore, studies in Pakistan and Indonesia also showed that Amoxicillin was the most commonly used SMA (Jawad *et al*., 2014; Widayati *et al*., 2011). A study in United Arab Emirates revealed that Amoxicillin was also commonly used by participants and their children for self-medication (46.3% and 70% respectively), followed by Amoxicillin-clavulanate. While, Ciprofloxacin and Norfloxacin were used only by adult participants (Abasaeed *et al*., 2009).

Studies conducted in Africa revealed that in Ghana, 70% of respondents took antibiotics (Amoxicillin, Ampicillin) without prescription. While in Nigeria, the most common antibiotic used for self-medication was Metronidazole followed by Ampicillin, Cloxacillin, Tetracycline, Amoxicillin and Cotrimoxazole, Ciprofloxacin, Ampicillin, Amoxicillin-clavulanate and Chloramphenicol (Tamuno and Mohammed, 2011). Another study in Nigeria also showed that Ampicillin and Ampicillin-cloxacillin combination were frequently used ahead of Metronidazole for a variety of conditions by people who engaged in self-medication (Olayemi *et al.*, 2010).

Moreover, study in Srilanka showed that Amoxicillin, Erythromycin, Cephalexin and Cloxacillin were the most widely used SMA (Gunawardhana *et al*., 2015). A finding by Eticha *et al*. (2014) in Mekelle town of Ethiopia found Amoxicillin as the most commonly used antibiotic for self-medication (43.3%), followed by Ampicillin and Ciprofloxacin. Amoxicillin was frequently used antibiotic because of its low price of Penicillin's in many parts of the world and wide prescription of these antibiotics by health providers that led people to recognize these agents (Heidarifar *et al*., 2013). An Indian study conducted among HCPs revealed that Pencillins and Cephalosporines as the common antibiotics used for self medication (Pankaj *et al*., 2015).

Another study in India revealed that Penicillins, Flouroquinolones and Macrolides were the most commonly used antibiotics by allopathic doctors (Nalini, 2010).

WHO has reported that there are alarming levels of drug resistance to Penicillin's, Fluoroquinolone's and third generation Cephalosporin's among the member nations (WHO, 2012; WHO 2014).

3. Objective of the study

3.1. General objective

- To assess the antibiotic self-medication practices among HCPs in selected public hospitals of Addis Ababa.

3.2. Specific objectives

- To determine the prevalence of SMA practice among HCPs in selected public hospitals of Addis Ababa.

- To identify major illnesses/symptoms of illnesses those necessitate SMA among HCPs in selected public hospitals of Addis Ababa.

- To assess category of antibiotics commonly used for self-medication by HCPs in selected public hospitals of Addis Ababa.

- To identify factors associated with SMA practices among HCPs in selected public hospitals of Addis Ababa.

4. Methods

4.1. Description of the study area and setting

The study was conducted in Addis Ababa city which is the capital and largest city of Ethiopia. It is located at the geographic center of the country and it covers about 540 km^2. According to the Central Statistics Agency (CSA) 2007 national census the projected population of Addis Ababa in 2018 was estimated to be more than 3.5 million (CSA, 2013).

During the study period, Addis Ababa city had a total of 14 public hospitals, 37 private and Non-Governmental Organization hospitals (FMOH, 2014). Out of the 14 public hospitals, four are under the Federal Ministry of Health (FMOH), one University Hospital (Tikur Anbesa Specialized Hospital under Addis Ababa University) and three of them are Armed Force, Federal Prison and Federal Police hospitals. The remaining six hospitals are managed under Addis Ababa City Health Bureau (AACHB), the total number of HCPs (Physician, Nurse and Pharmacist) working in these hospitals was found to be 1354. The study was conducted in four selected hospitals under AACHB.

4.2. Study design and period

Hospital based cross sectional study design using quantitative method of data collection was employed. Data were collected from April to May, 2017 using self-administered questionnaire containing open and closed ended questions.

4.3. Source and study population

The source population was all HCPs working as staff in public hospitals under AACHB in 2016/17. All Physicians, Nurses and Pharmacy professionals who were working in selected hospitals and who meet the inclusion criteria were study population.

4.4. Inclusion and Exclusion criteria

Physicians, Pharmacists and Nurses working in the selected hospitals, available during data collection period and volunteer to participate were included in this study. Those HCPs other than Physicians, Nurses, Pharmacy professionals and interns were excluded from the study.

4.5. Sample size determination and sampling procedure

4.5.1. Sample size determination

Based on literature review there was no previous study conducted regarding SMA among HCPs in Ethiopia. Therefore, the following assumptions were made to obtain the maximum possible sample size (Kirkwood and Sterne, 2003). The sample size determination was based on:

p = 0.5, **d**= 5% and using 95% confidence level:

$$ni = \frac{z^2 \, p\,(1-p)}{d^2}$$

Where, ni = initial sample size,

z = statistic for 95% level of confidence

d = precision/ margin of error

p = expected prevalence of SMA practice among HCPs

$$\Rightarrow ni = \frac{(1.96)^2 \times (0.5) \times (1-0.5)}{(0.05)^2} = \mathbf{384}$$

Based on estimation of proportion from a finite population of size N, the final sample size was calculated as follows (Kirkwood and Sterne, 2003).

$$nf = \frac{ni}{1 + \frac{(ni)}{(N)}}$$

Where: nf = final sample size and

N = total number of HCPs working in public hospitals under AACHB (sampling frame). This data was obtained from human resource department of the six hospitals =1354 HCPs

$$n_f = \frac{384}{1 + \frac{(384)}{(1354)}} = \mathbf{300} \text{ HCPs}$$

Adding 10% (contingency) for incomplete and non-responses, the total sample size required for this study was found to be 330.Then the number of HCPs to participate from each hospital was decided based on sampling proportionate to size.

4.5.2. Sampling procedure

Multi-stage sampling techniques were used to select the study participants (see Fig.1). First, all of the six hospitals under AACHB were listed and among them four hospitals (Zewditu, Yekatit 12, Ras Desta Damitew and Minillik II Memorial hospital) were selected by using a lottery method. The total number of HCPs was retrieved from human resource department of the six hospitals and this data was used as a sampling frame. Then, the total sample size was obtained. The number of HCP to be sampled from each hospital was determined based on proportionate to size of the staff. After this, HCPs were further stratified into Physician, Nurse and Pharmacy professionals and the final sample size was allocated proportionally based on their respective number of HCPs from each department in each hospital. It was observed that there was high patient flow and hard to apply either simple random sampling or systematic random sampling procedures to select study participants. Therefore, convenient sampling method was used to select the final sampling units.

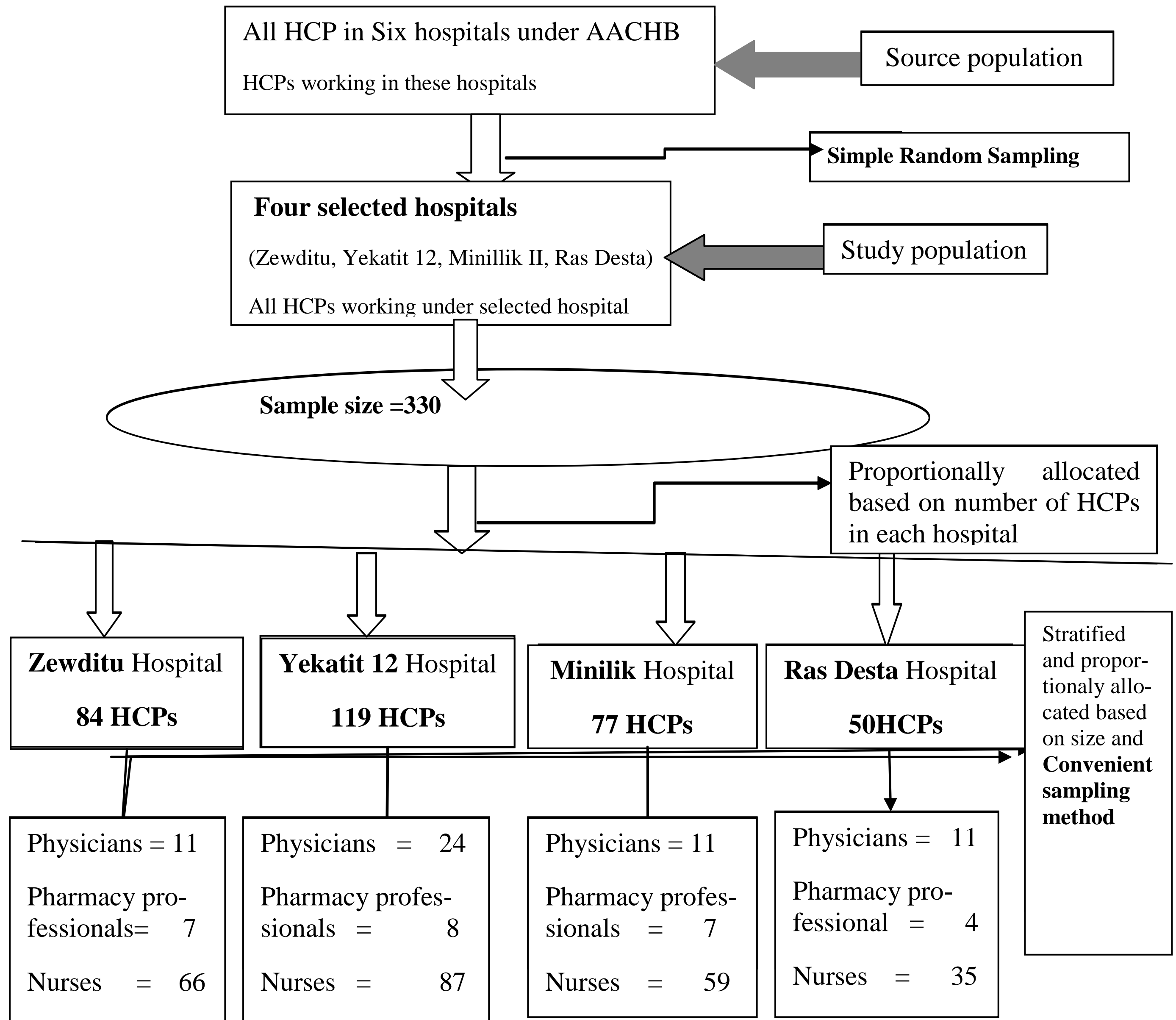


Figure 1: Diagrammatic representation of sampling techniques for HCPs included in the survey in public hospitals of Addis Ababa, April, 2017.

4.6. Data collection and data management

4.6.1. Data collection tool

Data were collected using a pre-tested self-administered questionnaire consisting of 9 open and 18 closed ended questions. It was prepared in English language by reviewing the previous similar studies. (Abasaeed *et al*., 2009; Abdulraheem *et al*., 2016; Ali *et al*., 2012; Fadare and Tamuno**,** 2011; Pankaj *et al*., 2015). The questionnaire included questions on socio-demographic characteristics of respondents, practice of self-medication, reasons for self-medication, type of antibiotics used and common indications for SMA. All items in the questionnaire were related to the recall period of one month. The duration of one month was chosen because of the belief that recall of medication use for HCPs is very reliable within that time frame and also this recall period was used by other similar studies (Awad *et al*.,2005; Sado and Gedif, 2014; Widayati *et al*., 2011; Worku and G/Mariam, 2003).

Two health professionals (one Pharmacist and one Nurse) were recruited for data collection. In addition, the principal investigator was also involved in the data collection. The questionnaire was handed over to respondents in person. Some of the questionnaires were filled and returned on the same day and the rest after few days.

4.6.2. Data processing and analysis

During data collection process the data was checked for its completeness and consistency. The completed data was cleaned, coded, entered and analyzed by using Statistical Package for Social Sciences (SPSS) version 20 software. Descriptive statistics such as frequency and percentages were used to present the data. The responses to the open ended questions were grouped, coded, analyzed and presented with frequencies of similar responses.

Moreover, to determine factors associated with SMA, bi-variate and multi-variate statistical analysis was conducted. Variables found to be significant ($p<0.25$) in the bi-variate analyses were transferred to multivariate regression and then multivariate regression was performed. Levels of significance was set at 5% that is, $p < 0.05$ was considered statistically significant to

explore associations among variables. Finally, the results of the study were presented in tables, figures and graphs.

4.6.3. Data quality management

Before the start of actual data collection, the questionnaire was pre-tested on 15 HCPs working in one hospital in Addis Ababa which was not included in this study. The test was done to check whether the questions were clear and could be consistently communicated and consequently only slight modification was made in using some words. The data collectors were trained by the principal investigator for half day on how to give standard instruction, clarify questions, approach respondents, how to obtain informed consent and how to secure confidentiality during the data collection. The collected data were checked by principal investigator on daily basis for its accuracy and completeness.

4.7. Variables of the study

4.7.1. Dependent variable

- Antibiotic self-medication

4.7.2. Independent variables

- Sex
- Age
- Marital status
- Income
- Profession
- Work experience
- Level of professional qualification

4.8. Ethical consideration

Ethical approval for this study was obtained from Ethics Review Committee of the School of Pharmacy, Addis Ababa University and AACHB. The selected hospitals were communicated with formal letter written from AACHB ethical review committee and data collection started after permission was obtained from hospital administrators. Participants were asked for written and signed consent before participating in the study. During the consent process, each participant was provided information regarding the purpose of the study, why and how they were selected to be involved in the study, what was expected of them and the confidentiality of information acquired. Confidentiality was assured by not using any personal identifiers in the questionnaire and analyzing data in aggregate. They were also informed their full right not to answer any of the questions in the questionnaire. Contact person was also offered for any question related with the study.

5. Results

In this study a total of 330 questionnaires were distributed in four selected public hospitals managed under AACHB. Out of the 330 questionnaires distributed, 317 respondents properly filled and returned the questionnaires making a response rate of 96%.

5.1. Socio-demographic characteristics of the respondents

Among the 317 respondents, 164 (51.7%) were female. The mean age of respondents was 29.0 ± 6.7(mean ± SD) ranging from 20 to 55years. Majority 223 (70.3%) of them were in the age group between 20-30 years old. In terms of marital status, 189 (59.6%) of respondents were single. Regarding their profession, majority of the respondents were Nurses 236 (74.4%) followed by Physicians 55 (17.3%) and Pharmacy professionals 26 (8.4%). About level of education majority 263 (82.9%) of them were first degree holder and above. In addition, 206 (65%) of the respondents had less than 5 years of professional work experience (Table 1).

Table 1: Socio-demographic characteristics of respondents in selected public hospitals of Addis Ababa, April, 2017.

Variables		**Frequency**	**Percentage**
Sex	Male	153	48.3
	Female	164	51.7
Age group	20-29 yrs	223	70.3
	30-39 yrs	65	20.5
	40-49 yrs	22	6.9
	50-59 yrs	7	2.2
Marital status	Single	189	59.6
	Married	120	37.8
	Others*	8	2.5
Monthly income (ETB)	1001-4000	82	25.9
	4001-7000	139	43.8
	7001-10000	81	25.6
	Above 10000	15	4.7
Profession	Physicians	55	17.3
	Pharmacy Professionals	26	8.2
	Nurses	236	74.4
Professional experience	$\leq$5 years	206	65.0
	6-10 years	68	21.5
	Above 10 years	43	13.6

*Others- divorced, widowed and separated

5.2. Health seeking behavior of respondents

Respondents were asked about their health seeking behavior when encountered illness and more than half of the study participants 164 (52%) would like visiting modern health facility as the first option. Whereas, 111 (35%) of respondents preferred self-medication as the first line of action in case of feeling illness (Figure 2).

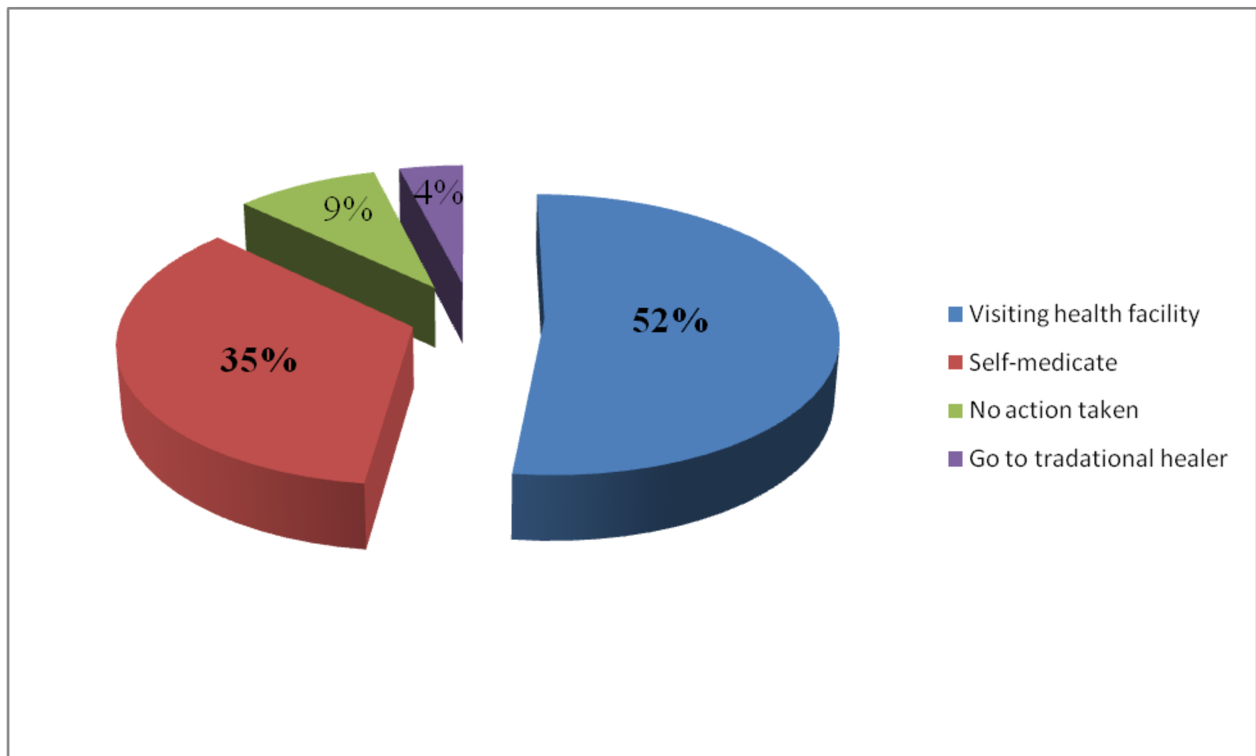


Figure 2: First actions respondents would like to take in case of illness in selected public hospitals of Addis Ababa, April, 2017.

Of those who preferred self-medication 71 (63.9%) and 46 (41.4%) of participants reported to commonly use anti-pains and antibiotics respectively (Table 2).

Table 2: Types of medicines respondents mostly self-medicate in selected public hospitals of Addis Ababa, April, 2017.

Category of drugs	Frequency	Percentage
Anti-pains	71	63.9
Antibiotics	46	41.4
Anti acids	10	9.0
Others**	4	3.6
Could not specify	2	1.8

NB: Multiple responses possible and hence the sum of the percentage may be more than 100.

Others**: anti-helmentics and anti-protozoals

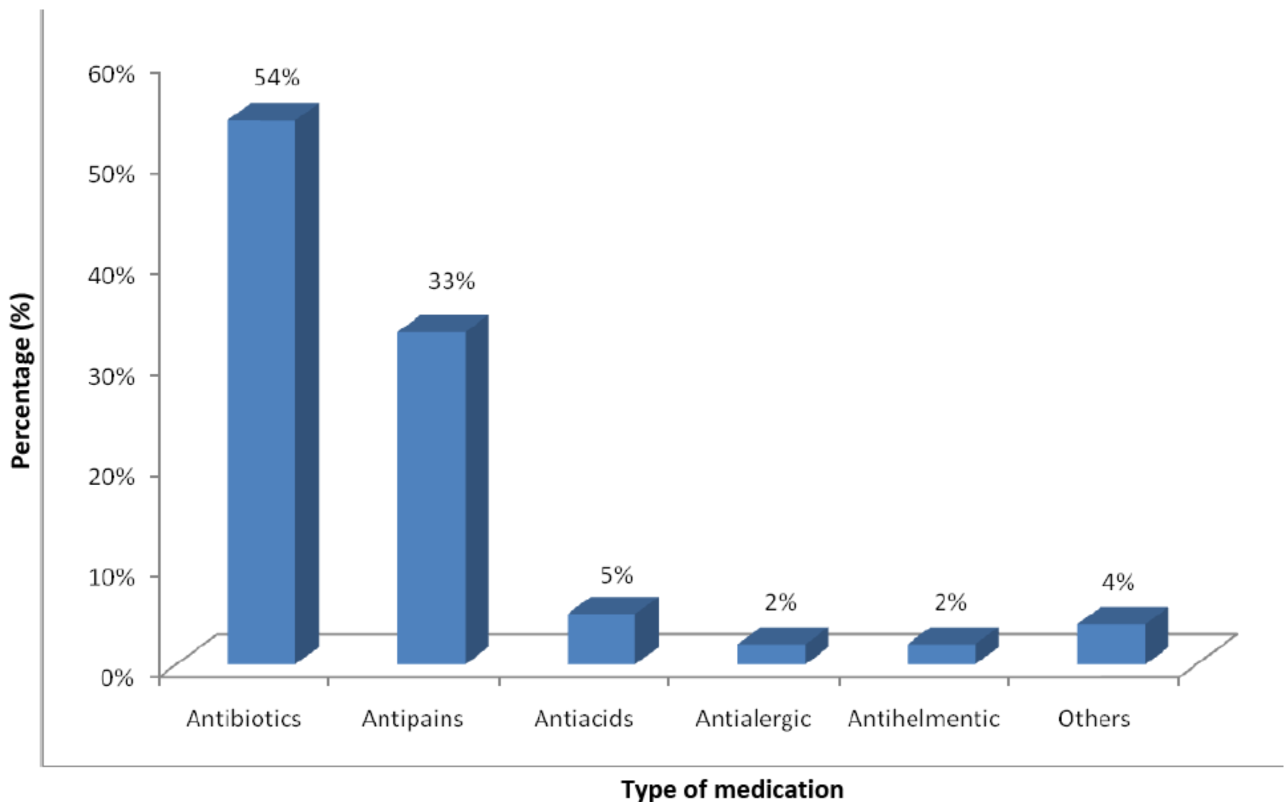
Of the total 317 respondents, 166 (52.4%) HCPs believed that they could treat common infectious diseases successfully by themselves. However, 84 (26.5%) of HCPs thought that they could not treat by themselves and the remaining 67 (21.1%) were unsure.

Regarding the safety of SMA, 148 (46.7%) of the respondents felt that it is a safe practice. From those respondents who said it unsafe, 85 (50.3%) mentioned the risk of developing resistance. Thirty three (19.5%) risks of misdiagnosis and 9 (5.3 %) delay in recovery time due to wrong use of antibiotics as reasons considering SMA as unsafe practice. In addition, believed that it is unethical 20 (11.8%) and most infectious diseases need laboratory investigation 22 (13%) were also suggested claims for not considering SMA as safe practice.

The respondents were also asked questions regarding the term 'antibiotic resistance' 204 (64.4%) of respondents claimed that have a knowledge about it and elaborate it in words. While, 61 (19.2%) of respondents said they have knowledge but could not elaborate in words and 52 (16.4%) respondents reported as they did not know about antibiotic resistance.

5.3. Prevalence of self-medication practices in one month recall period

All study participants were asked whether they had taken any medicine without prescription during the last one month before the interview date. Out of the 317 participants, 133 (41.9%) reported that they had self-medicated with modern medicines. Among the modern medicines used by study participants, antibiotics were the most commonly used ones 72 (54%) followed by anti-pain medications 44 (33%). Among participants self-medicated with modern medicines 17 (13%) reported to have used combination of antibiotics and anti-pains (Figure 3).



* Others- Oral Rehydration Salt, Ferrous sulphate + Folic acid, Sildenafil Citrate.

Figure 3: Category of medicines used for self-medication by HCP in one month recall period in selected public hospitals of Addis Ababa, April, 2017.

According to this study the overall prevalence of SMA among HCPs was found to be 72 (22.7%) during 30 days preceding the data collection period; of them 51 (70.8%) were Nurses, 13 (18.1%) Physicians and 8 (11.1%) were Pharmacy Professionals. Thus, further data analysis was done only for these study participants.

5.4. The pattern of antibiotics use for self-medication

Among those who practiced SMA, 67 (93.0%) self-medicated once and the remaining did it twice with different antibiotics in one month recall period. However, for better recall only the second period of antibiotic use was analyzed to describe the patterns of SMA.

About 19 (26.4%) of the respondents claimed to have experienced side effects such as diarrhea, vomiting, gastritis, nausea, dizziness and rush after taking the antibiotics. Out of the total respondents who had experienced side effects, 6 of them stopped taking antibiotic and one of the respondent reduced the dose in response to the side effect of antibiotic.

Among all respondents who self-medicated with antibiotics 33 (45.8%) of them did not take full dose of antibiotics. The main reasons being feeling better in few days 21 (63.6%) and side effect encountered 12 (36.4%).

Regarding sources of antibiotics for self-medication, the majority 37 (51.4%) of respondents had obtained the antibiotic from hospital pharmacies followed by community pharmacies 28 (38.9 %) (Figure 4).

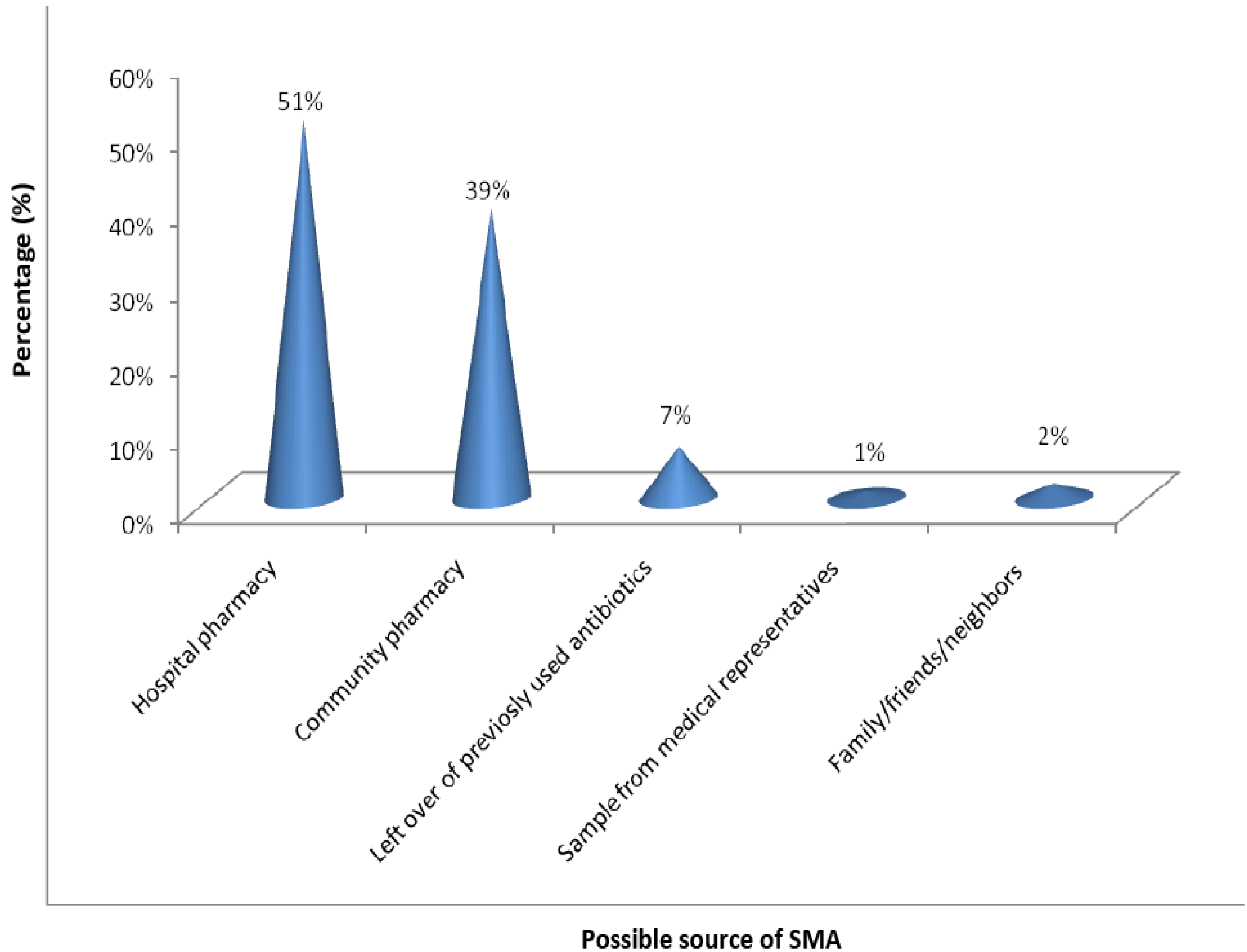


Figure 4: Sources of SMA among respondents in selected public hospitals of Addis Ababa, April, 2017.

5.5. Reasons for antibiotic self-medication

Respondents were asked about the reasons for using SMA. As shown in Figure 5 below, the most common reasons for HCPs to practice SMA were being familiar with treatment 31 (37.3%) and getting quick relief 25 (30.1%).

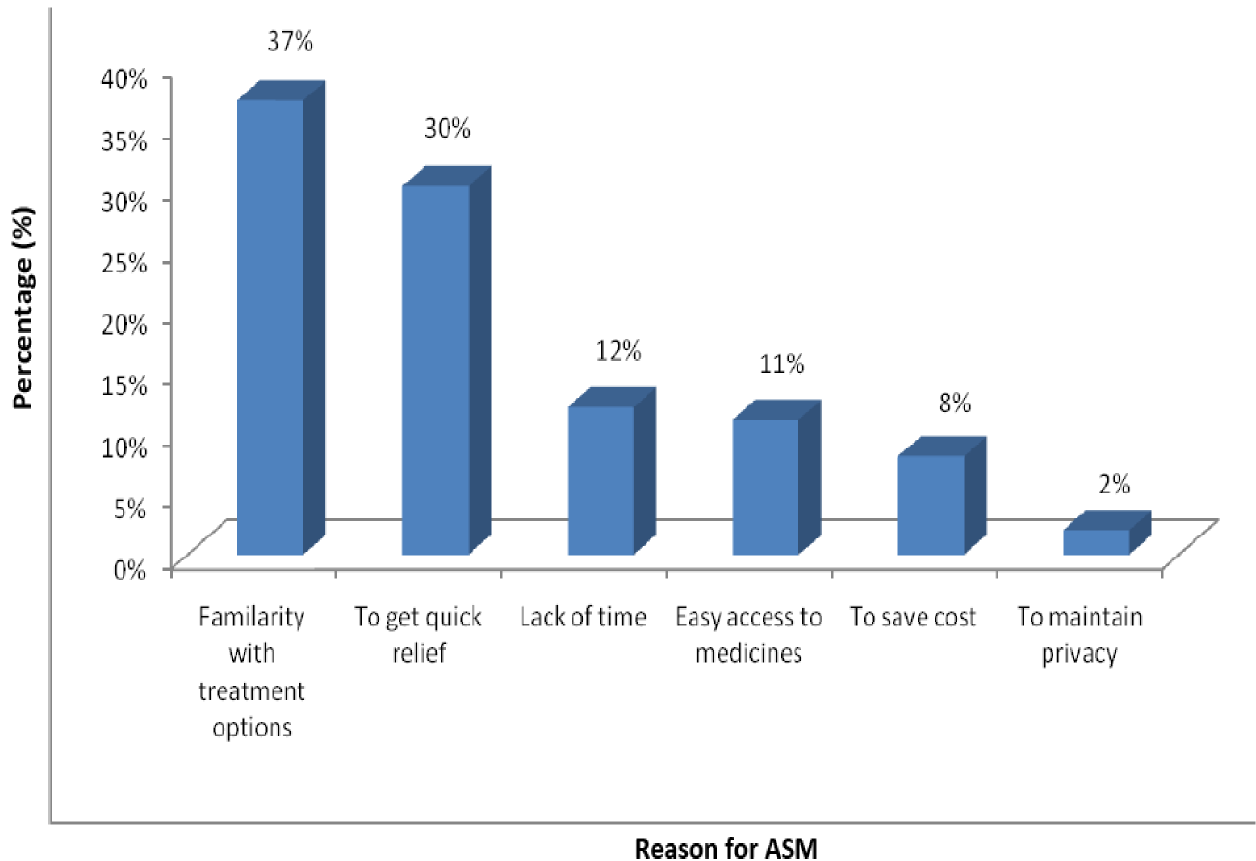


Figure 5: Reasons for antibiotic self-medication among HCPs in selected public hospitals of Addis Ababa, April, 2017.

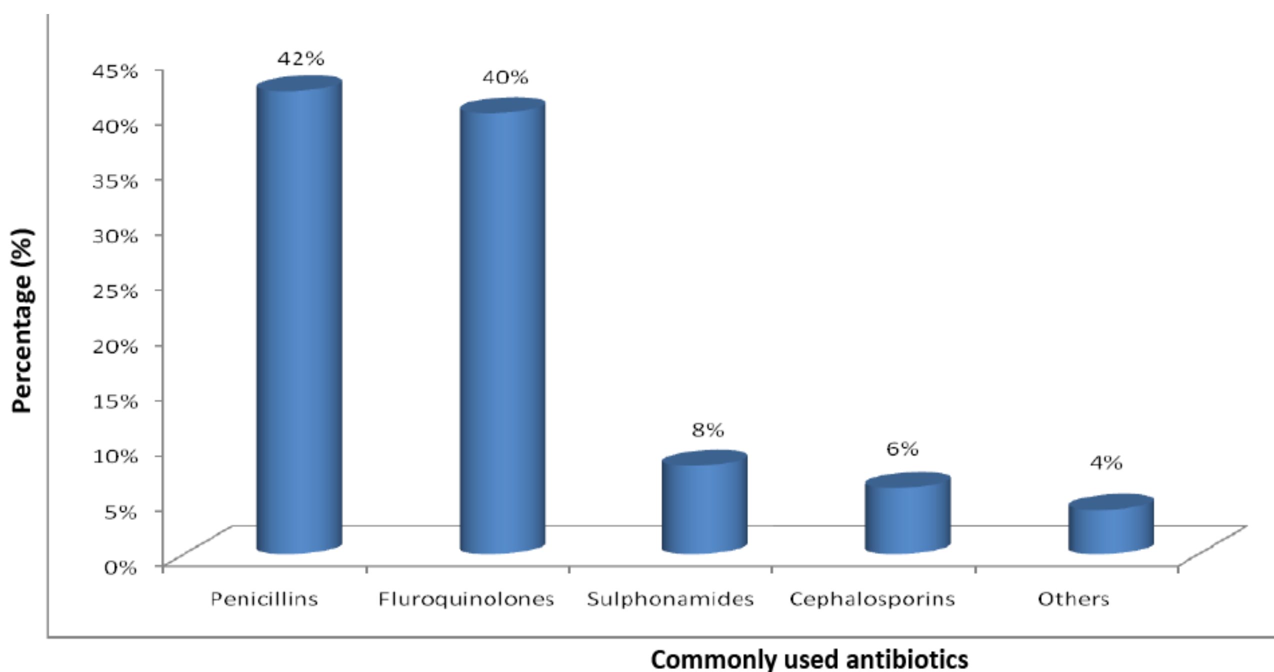
5.6. Perceived illnesses commonly used for antibiotics self-medication

The main perceived illnesses against which they practiced SMA among respondents were respiratory problems (common cold, tonsillitis and sore throat accounting 29 (40.3%) and gastro intestinal problems 28 (38.9%) (Table 3).

Table 3: Perceived illnesses against which HCPs claimed to have self-medicated with antibiotics in selected public hospitals of Addis Ababa, April, 2017.

Perceived illnesses	Frequency	Percentage
Respiratory problems	29	40.3
Gastro intestinal problems	28	38.9
Skin problems	3	4.2
Urinary tract problems	6	8.3
Unidentified cases	6	8.3
Total	72	100.0

Respondents were also asked to mention the name of antibiotics they had used without prescription. Most of the reported antibiotics were Penicillins 30 (41.6%), followed by Fluoroquinolones 29 (40.3%). (Figure 6).



Others* Tetracycline, Aminoglycosides and Macrolides

Figure 6: Commonly used antibiotics for self-medication by HCPs in selected public hospitals of Addis Ababa, April, 2017.

Moreover, the study participants were asked about the outcome of SMA, and 35 (48.6%) of them reported being cured from their illness and 22 (30.5%) said that there was improvement in their illness. Whereas, the remaining respondents 15 (20.8%) said they were neither cured nor improved after SMA. Consequently, 9 of 15 respondents visited the health facility and three of them continued self-medication with another antibiotic. Homemade remedies and holy water were also tried by few of the respondents.

5.7. Suggested solutions to reduce antibiotics self-medication

All of the study participants were asked open ended questions to suggest the possible solution and recommendations in order to avoid or reduce SMA. More than half the study participants 165 (52%) said that creating and increasing awareness about AMR is essential. The other possible solution suggested by 25 (8%) participants was that all medical college and university students should be given intensive course AMR before graduation. Pharmacists should not dispense self-prescribed antibiotics constituted 38 (12%). In addition, 136 (43%) respondents mentioned enforcing strict rules and regulations on sale of antibiotics.

5.8. Factors associated with self-medication practices of antibiotics

In multivariate logistic regression analysis, none of the socio-demographic factors tested were significantly associated with SMA practices (Table 5).

Table 4: Factors associated with self-mediation using antibiotics among HCPs in selected public hospitals of Addis Ababa, April, 2017.

Variables		SMA practice		COR (95%CI)	AOR(95%CI)
		Yes	No		
Sex	Male	33(45.8%)	25(41.0%)	1.00	1.00
	Female	39(54.2%)	36(59.0%)	0.82[0.41-1.63]	1.5[0.7-3.3]
Age(yrs)	20-29	56(77.8%)	39(63.9%)	1.00	1.00
	30-39	13 (18.1%)	14(22.9%)	0.26[0.06-1.05]	1.9[0.5-6.7]
	40-49	3(4.1%)	8(13.1%)	0.40[0.09-1.86]	07.6[0.9-64]
Marital status	Single	43(59.7%)	32(52.4%)	1.0	1.0
	Married	29(40.3)	29(47.5%)	1.3[0.7-2.7]	1.0[0.4-2.4]
Monthly income (ETB)	1,001-4,000	14(19.4%)	16(26.2%)	1.14[0.24-5.44]	4.8[0.3-78.7]
	4,001-7,000	36(50.0%)	22(36.1)	0.61[0.14-2.69]	2.8[0.2-33.1]
	7,001-10,000	18(25%)	19(31.1%)	1.06[0.23-4.87]	2.2[0.3-15.6]
	Above 10,000	4(5.5%)	4(6.5%)	1.00	1.00
Profession	Physicians	13(18.0%)	14(22.9%)	1.00	1.00
	Pharmacy professionals	8(11.1%)	4(6.5%)	1.28[0.54-3.01]	3.0[0.6-15.5]
	Nurses	51(70.8%)	43(70.5%)	0.59[0.17-2.10]	0.8[0.2-3.4]
Education	Diploma	6(8.3%)	12(19.7%)	1.00	1.00
	First degree	60(83.3%)	44(61.1%)	0.37[0.13-1.05]	0.3[0.1-1.3]
	Above1st degree	6(8.3%)	5(8.2%)	0.42[0.09-1.94]	0.3[0.04-2.3]
Experience	0-5 years	51(70.8%)	36(59.0)	1.00	1.00
	6-10 years	13(18.0%)	15(24.6%)	0.56[0.20-1.57]	1.6[0.5-5.5]
	Above 10 years	8(11.1)	10(16.4%)	0.92[0.28-3.03]	1.1[0.2-7.3]

6. Discussion

In this study, the prevalence of SMA among HCPs (Physician, Nurse, Pharmacy professional) in public hospitals under AACHB was investigated.

Beliefs, feelings and thoughts of an individual significantly influence his/her understanding of an illness, which in turn affects the decision taken to address it (Leyva-Flore, 2001). Among all study participants 111 (35%) of respondents claimed that they would prefer self-medication before taking any other action in case of illness. However, study in China respondents who were asked if they felt physical discomfort, reported that 39.1% of the respondents would prefer to see the doctor, 45.4% would select self-medication and 15.5% nothing to do (Lei *et al*., 2018).

Respondents would prefer to commonly use anti-pain and antibiotics for self-medication. It is understood that majority of the anti-pains are available as OTC medicines in retail outlets. However, the common use of antibiotics for self-medication is alarming in the face of increasing threat of antibiotics resistance. The findings of this study are similar to others finding (Abay and Amelo, 2010; Baruzaig and Bashrahil, 2008; Belachew *et al*., 2011; Sajith *et al*., 2018; Sawalha, 2007).

Study on antimicrobial resistance in Nekemte showed that *Salmonella* and *Shigella* species were resistant to Amoxicillin with 90% and 77.7% respectively (Terfassa and Jida, 2018). In addition, another study in Mekelle revealed that 86.7 % of *Shigella* was resistance to Amoxicillin, high resistance was also observed to Cotrimoxazole 66.7 % (Gebrekidan *et al*., 2015). The resistances of *Enterococci* and *E.coli* isolates to Ciprofloxacin were 54.2% and 47.4% respectively (Mekuria *et al*., 2017).

Not only respondent's preferences in the case of illnesses but also the practice of self-medication in the four weeks recall period was investigated in this study. In this regard the prevalence of SMA among HCPs was found to be 22.7%. Although, there was no similar study conducted on HCPs with SMA in Ethiopia, comparison was done with self-medication practice in the general population. Community based study in Nekemte town showed a prevalence of 33%; which is higher than SMA among HCPs (Sado and Gedif, 2014). It is also less than studies conducted in

India and Nigeria where the prevalence was 88.6% and 38.6% respectively (Fadare and Tamune, 2011; Pankaj *et al.,* 2015). The finding of the present study is however higher than similar study in Malaysia which was found to be 6.7% (Ali *et al.,* 2012). This variation could be attributed to the difference in methodology of the research and recall periods used. Therefore, the percentage differences observed among different groups and different countries might not reflect actual variations in use or non use of self-medication (Kasulkar and Gupta, 2015).

The Finding of this study revealed that 51.4% of respondents obtained the antibiotic from Hospital pharmacies followed by community pharmacies 38.9%. This finding was not similar with other studies done among the general population and university students where most of respondents obtain their drugs from community pharmacies (Afolabi *et al*., 2014; Donkor *et al*., 2012; Heidarifar *et al*., 2013; Kiragu *et al*., 2016).

The finding of this study revealed that Pharmacy professionals, Physicians and Nurses with the prevalence of SMA 30.8%, 23.6% and 21.6% respectively. This study was consistent with an Indian finding (Pankaj *et al.,* 2015). This was due to the fact that Pharmacists and Physicians are among the HCP with the greatest access to medications and have impressive knowledge of prescription drugs and their use in the treatment of various drug therapies which increase the potential of self-medication (Ali *et al.,* 2012; Balbisi and Ambizas, 2005). Other studies of Indian Nurses and Physicians revealed SMA prevalence of 53.5% and 53% respectively which is higher than the present finding (Gholap and Mohite, 2013; Nalini, 2010). The difference could be due to short recall period was used in the present study.

In the present study self-medication among HCPs appeared to be more driven by knowledge of diagnosis and treatment options. This was consistent with other findings (Ali *et al*., 2012; Gholap and Mohite, 2013; Harris *et al*., 2013; Pankaj *et al*., 2015). This means that they have imposed their subjective judgment in determining both their own diagnosis and treatment when they are ill. Lack of time was also the other reason for practicing SMA. Having high patient load and absence of functional separate system for HCPs may predispose them to self medicate instead of consulting a doctor for it. Easy access to medicines was also reported as a reason for SMA

(Abdulraheem *et al*., 2016; Donkor *et al*., 2012; Harris *et al*., 2013). Although not a significant proportion, the present study also reflected the same.

Regarding disease conditions treated with SMA, similarities were observed between this study and others (Abasaeed *et al*., 2009; Pant *et al*., 2015; Shankar *et al*., 2002; Widayati *et al*., 2011). Respiratory problems (common cold, sore throat and tonsillitis) and gastro intestinal problems were the main illnesses for SMA in the current study. The same was reported in Indonesia and Iran (Heidarifar *et al.,* 2013; Sarahroodi *et al*., 2010; Widayati *et al*., 2011). Respiratory problems are mostly due to viral infection, which do not require antibiotics instead they can be managed by home remedies and some OTC drugs. This inappropriate use may contribute to antibiotic resistance (Linder and Stafford, 2001).In contrary, finding in Nigerian showed that urinary tract infections were the predominant disease conditions against which respondents practiced SMA (Osemene and Lamikanra, 2012).

According to this study Penicillins were the most commonly used antibiotics followed by Fluroquinolones for self-medication. This finding was consistent with studies in Europe, India, Iran and Sierra Leone (Afolabi *et al*., 2014; Eticha *et al*., 2014; Grigoryan *et al.*, 2008; Pankaj *et al*., 2015). Ciprofloxacin being the most frequently used drug for self-medication in this study. Similarly, study by Mekuria (2017) revealed that the overall bacterial resistance to Fluoroquinolones was found to be 42.5% (Mekuria *et al.,* 2017). HCPs have greater responsibility for eliminating or reducing AMR rather than contributing for the expansion of drug resistance. The second widely used antibiotic in this study was Amoxicillin. Similarly, findings in Ethiopia also showed that Amoxicillin, Ciprofloxacin and Cotrimoxazole were the most common antibiotics sold in community pharmacies as OTCs (Beedemariam and Kaba, 2016). In addition, in other countries the use of Amoxicillin for self medication was predominant (Abasaeed *et al*., 2009; Donkor *et al*., 2012; Eticha *et al.,* 2014; Gunawardhana *et al*., 2015).

In this study it was reported that 45.8% of respondents did not complete full course of antibiotics. This finding is higher than from similar study finding in Iran (Sarahroodi *et al*., 2010). It is widely believed that human malpractices such as inadequate dosing, incomplete

courses and indiscriminate drug use have contributed to the emergence and spread of AMR. The consequence of this is the switch from relatively cheap to new drugs. Resorting to the new and more expensive drugs to fight microbial resistance leads to additional problems for resource poor countries (WHO, 2001). Thus the rational use of antibiotics is thus of utmost importance to limit the emerging AMR prevalence. As HCPs are highly likely to affect the behavior of their patients towards rational use of medicines, they should be model and teach the public about self-medication and AMR.

Previous studies reported mixed result about the association of SMA and gender. While some found significant and positive association between SMA and gender in Abudabi, Nigeria and Sudan (Abasaeed *et al.*, 2009; Abdulraalheem *et al*., 2016; Awad *et al*., 2005). Whereas, others studies didn't showed significant association (Donkor *et al*., 2012; Fadare and Tamuno, 2011). Some studies showed that educational level was significantly associated with the practice of SMA (Abasaeed *et al*., 2009; Abdulraheem *et al*., 2016; Awad *et al*., 2005; Osemene and Lamikanra, 2012). Similar studies also revealed that the risk of self-medication was significantly associated with Age *(*Abasaeed *et al.*, 2009; Kiragu *et al*., 2016; Osemene and Lamikanra, 2012). However, the present study showed that socio-demographic variables had no significant association with the practice of SMA. This finding is consistent with the previous studies in Indonesia, Pakistan and United Arab Emirates (Jawad *et al*., 2014; Shehnaz *et al*., 2013; Widayati *et al*., 2011).

7. Strength and Limitations of the study

7.1. Strength

In this study different health care professionals were involved, which provide comprehensive data.

7.2. Limitations

The collected data were self-reported which may introduce social desirability bias. In addition, the other limitations are the study used convenience sampling method which may affect the representativeness of the data and the short recall period used for this study may also affect the finding.

8. Conclusion

The prevalence of SMA among HCPs in selected hospitals under AACHB was found to be 22.7 % which is high. The major illnesses claimed to have been treated with self-medication using antibiotics are Respiratory tract problems, Gastro-intestinal problems, Skin problems and Urinary tract problems. The most widely used antibiotics for self medication in this study were Penicillins, Floroquinolones, Cephalosporins, Sulphonamides and Tetracyclines. From the aforementioned group of antibiotics, Penicillins (41.6%) and Floroquinolones (40.3%) were the most widely used antibiotics. The main reasons mentioned for their preference of SMA were familiarity with treatment options, to get quick relief and lack of time. Finally, in this study there was no significant association between SMA and socio-demographic characteristics of the study participants.

In general, potentially dangerous effects of SMA seemed to be underestimated by HCPs. Effort should be made to discourage this practice and ensure safe usage of antibiotics. This needs attention of health authorities such as Drug and Therapeutic Committee.

9. Recommendations

Based on the findings of this study the followings are recommended:

- Drug and Therapeutic Committee should give regular training for HCPs on the rational use of antibiotics and consequences of SMA. The hospital management should give special attention to AMR as one of day to day activity plan to improve the rational use of antibiotics.

- The drug regulatory authority must apply strict and vigilant law enforcement policy to limit the sale of antibiotics as OTC. Enforcement of antibiotic policies is necessary to decrease the risk of resistance by restricting the purchase of antibiotics without prescription and taking measures regarding the practice.

- Furthermore, in future national research should be done on SMA practices of all HCPs.

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Annexe I. Consent Form

Addis Ababa University
School of Pharmacy
Department of Pharmaceutics and social Pharmacy

Hello, my name is Tsehay Kassa. I am Master of Science student on Pharmacoepidimology and Social pharmacy, School of Pharmacy in Addis Ababa University. I am conducting research on my final thesis entitled "self medication practice with Antibiotics among Health professionals in public Hospitals under Addis Ababa Regional Health Bureau". The objective of this study is to asses self medication practice with antibiotics among health professionals in public hospitals of Addis Ababa. The study is believed to be helpful for determining the prevalence and identify determinants of self medication practice with antibiotics among health professionals.

To attain the objective of this study your ideas, experience and insights would be very valuable and I will be very grateful if you are participating in this study. The questionnaire will take about 10 to 15 minutes. The information you provide is kept confidential with unique code. Data will be analyzed in aggregate. If you have any question, don't hesitate to ask the data collector and you can withdraw from the study at any time. Your participation is voluntary, the information you will provide is very important. Therefore, kindly ask you to participate in this study.

Do you agree to participate?

Yes ☐ No o☐ Signature: ______________________

Participant code ______________________________

Principal investigator: Tsehay Kassa (+251 91 3556710)

E-mail: tsehaykassa302@gmail.com

Annex II. Self-administered questionnaire

Instruction: Please encircle your answer(s) or write your response in the blank space accordingly. Multiple answers are possible when appropriate.

Part I: Socio demographic characteristics of the respondent

1. Sex A. Male B. Female

2. Age _______________

3. Marital status A .Single B. Married
C. Divorced D. Widowed E. Separated

4. Average monthly income ________________ (in Birr)

5. Profession
A. Specialist/Sub specialist B. General Practitioner C. Pharmacist D. Druggist
E. Nurse (Degree) F. Nurse (Diploma) G. If other (specify) __________

6. Professional work experience_____________ (in years)

Part II: Self-medication practice in health professional

7. Have you self-medicated yourself to manage your illness in the last one month?
A. Yes B. No
If **No**, please go to question number 20

8. If **Yes**, please write the name of medicine(s) you have taken during the last one month?
____________________ _________________ ___________________

9. If you used antibiotics for self-medication, how many times have you treated yourself for the last one month? (N.B. If you took more than once, please answer the following questions for the last drug)

A. Once B. Twice C. Three times D. Four times

If you didn't practice antibiotics self-medication please goes to question number 20

10. For which complaint(s) did you self-medicate with antibiotics?

____________________ ____________________ ____________________ ____________________

11. Did you take the full dose of antibiotic(s) for your illness?

A. Yes B. No

12. If **No**, why you did not take the full dose of antibiotic(s)?

A. Better outcome in a few days B. Side effect was encountered

C. Symptoms of the illness not improved D. If other (specify) ___________________

13. What was (were) your reason(s) to self-medicate with antibiotics?

A. To save cost B. Lack of time C. Familiarity with treatment option

D. To maintain privacy E. Easy access to medicines F. To get quick relief

G. If other (specify) ___________________

14. From where did you obtain the antibiotic(s) for self-medication?

A. Community pharmacies B. Hospital pharmacy
C. Sample from medical representative D. Left over of previously used antibiotics
E. Family/ friends /neighbors F. Other (specify) _______________

15. Have you had any side effect when you took antibiotics self-medication?

A. Yes B. No
If your answer is **No**, go to question number 20

16. If yes, what was/were the side effect(s) you encountered?

A. Diarrhea B. Gastritis C. Nausea D. Vomiting
E. Rush F. Dizziness G. If other (specify) __________________

17. How did you manage the side effect(s) for the antibiotics?

A. Stopped taking antibiotics B. Switched to another antibiotic
C. Consulted other health professional D. changed the dose
F. If other (specify) __________________

18. What was the outcome of self -treatment?

A. Cured the illness B. Improved the illness
C. Neither cured nor improved the illness D. If other (specify) _________________

19. If the outcome was not successful, what did you do next?

A. Visited health facilities B. Continued self medication with changing the antibiotic
C. Goes to traditional healer D. If other (specify) ____________________

Part III: General information on self-medication

20. What is your first action most of the time when you feel ill?

A. Visit health facility B. Go to traditional healer
C. Self-medicate with medicine D. If other (specify) _______________

21. If you self medicate when you feel ill, what type of medicines you used most often?

________________ ________________ _________________ _________________

22. Do you think you can treat common infectious diseases with antibiotics successfully by your-self?

A. Yes, I can B .No, I can't C. Am not sure

23. Do you think self-medication with antibiotics is safe for health professionals?

A. Yes B. No

If your answer is **No**, can you justify?

____
____
____

24. Do you know about antimicrobials resistance?

A. Yes B. No

If your answer is **yes**, can you elaborate it?

____
____
____
____
____

25. What is your suggestion and recommendation to avoid or reduce antibiotic self-medication Practice?

____
____
____

Thank you for your participation

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Addis Ababa University

School of Pharmacy
Ethical Review Board

ቀን
Date December 20, 2016

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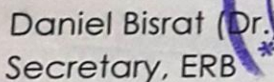
Ref. No. ERB/SOP/03/09/2016

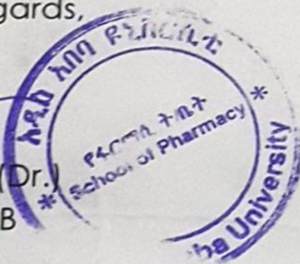
To: Tsehay Kassa
School of Pharmacy

Re: Ethical Clearance

It is to be recalled that you submitted a study proposal entitled, "Self Medication Practice with Antibiotics among Health Professionals in Public Hospitals under Addis Ababa City Administration of Ethiopia" for ethical approval by the School's Ethical Review Board (ERB). The Board thoroughly reviewed the proposal based on its operational guidelines and found it to fulfill all ethical requirements stipulated in the guidelines. This is, therefore, to inform you that the proposal is ethically approved for implementation.

With best regards,





Daniel Bisrat (Dr.)
Secretary, ERB

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