

Prevalence and predictors of self-medication with antibiotics among Adi-haqi Campus students of Mekelle University, Ethiopia

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Abstract

Background: Self-medication with antibiotics is one form of antibiotic misuse which enhances the development of antibiotic resistance. Antibiotic resistance is a worldwide public health problem which leads to treatment failures causing deaths and an increase in health care costs. The objective of this study was to determine the prevalence and predictors of antibiotic self-medication among students of Adi-haqi Campus of Mekelle University (ACMU) in Mekelle, Ethiopia.

Materials and methods: Across-sectional study was conducted among regular undergraduate students of ACMU in April 2014. The respondents were selected by stratified random sampling techniques. Data were collected with the help of a structured questionnaire and analyzed using the Statistical Package for the Social Sciences (SPSS), version 20.0 software.

Results: Of 407 study participants, 44.5% had self-medicated with antibiotics in their lifetime while 27.5% had practiced within the last three months. Using multiple logistic regression models, religion and prior residence of the respondents were significantly associated with antibiotic self-medication. Students who came from rural areas were less likely to self-treat with antibiotics than those who came from urban areas (AOR = 0.52, 95% CI: 0.32-0.86). Community pharmacies were the major source of antibiotics for self-medication and the most widely used one was amoxicillin. Antibiotics were used usually to treat common cold and/or headache, cough, abdominal pain and fever. Such practices were based on the common reasons of previous successful experience, mildness of the illness and saving time, and major sources of information were prior experience, community pharmacists and leaflets.

Conclusion: Self-medication with antibiotics was common among the study population. Community pharmacists should practice within the expected framework of their profession and sell over-the-counter drugs alone for self-medication purposes. The reinforcement of antibiotic policies needs to be monitored together with the development of more comprehensive measures to promote the rational use of antibiotics.

Keywords: Antibiotics; Self-medication; University Students

Introduction

Irrational use of antibiotics enhances the development of antibiotic resistance, which is a global public health problem. Antibiotic resistance leads to treatment failures causing deaths and an increase in health care costs [1,2]. One form of antibiotic misuse is self-medication practice with antibiotics, which is predominant in developing countries with loose regulatory systems. Antibiotics are often available without a prescription in such countries [3,4]. The prevalence of self-medication with antibiotics in African countries ranges from 11.9% to 76% [5-13].

Studies have reported that people purchase antibiotics without prescription from community pharmacies [14,15] to treat a variety of minor symptoms, such as the headache, fever, cough, common-cold, sore throat, runny nose, nasal congestion, diarrhea, menstrual symptoms, gastrointestinal tract infection, urinary tract and skin infections [5,9,11,14-17]. The most frequent reasons cited for self-medication with antibiotics are previous experience with similar illness and antibiotics, less expensive in terms of time and money, minor illnesses, assumed knowledge on antibiotics, and emergency use [5,7,11,14,15,18,19].

Self-medication practice with antibiotics among university students needs special attention owing to the fact that higher education level [17,19], younger age [17] and higher monthly allowance [15] have been associated with higher rates of the practice.

In Ethiopia, many studies investigated that the main sources of medications for those self-medicated are drug retail outlets, particularly community pharmacies [11,16,20,21]. As a result, mild illnesses are treated with antimicrobials which have a potential not only to harm the individual who consumes them but also the population at large [22]. Self-medication is potentially avoidable cause of antibiotic misuse and resistance [23]. These issues need to be addressed by the collective action of governments, health care providers, and consumers.

To the best of our knowledge, there is no study done on self-medication with antibiotics among university students in Ethiopia though some studies on general self-medication practice are available. Therefore, this study was carried out to determine the prevalence of self-medication with antibiotics among students of Adi-haqi Campus of Mekelle University (ACMU) in Mekelle and identify the factors associated with the practice.

Materials and methods

Study design and area

A cross-sectional study was conducted in ACMU found in Mekelle in April 2014. Mekelle is the capital city of Tigray region, at a distance of 783km from the Ethiopian capital city, Addis Ababa. Adi-haqi Campus is one of the campuses of Mekelle University that encompasses three colleges (Law and Governance, Social Science and Languages, and Business and Economics). There were twenty-two departments in the three colleges at the time of study.

Study participants and sampling

There were a total of 5,776 regular undergraduate students in Adi-haqi Campus. Regular undergraduate students who were available during the study period and voluntary to participate in the study were included. The sample size was determined using the formula for a single population proportion by taking the following assumptions: The estimated prevalence of antibiotic self-medication of 50% (to achieve maximum representative sample size) and 5% margin of error at 95% confidence level. The final sample size calculated was 422 after considering 10% non-response rate. Out of twenty-two departments of the three colleges, twelve departments were selected by using stratified sampling techniques. Then the selected departments were stratified based on a study year. Respondents from each study year were selected proportionally to their population size by simple random sampling techniques. The study was approved by the Health Research Ethics Review Committee of College of Health Sciences, Mekelle University. Participation of the students in this survey was voluntary and verbal informed consent was obtained before data collection.

Data collection and analysis

A structured questionnaire was developed by reviewing relevant literature and previously used standardized instruments. The questionnaire included: socio-demographic characteristics of the students, conditions for which antibiotics were self-medicated, reasons for antibiotic self-medication, antibiotics used for self-medication, sources of supply and information for self-medication with antibiotics. The pretested questionnaire was administered in English since the medium of instruction in high schools and Universities in Ethiopia is English.

The collected data were checked for completeness and consistency, and then analyzed using of Statistical Package for the Social Sciences (SPSS), version 20.0 software. For descriptive statistics, results were expressed in terms of frequency and percentages and association between antibiotic self-medication and independent variables was performed using logistic regression. Finally, multivariate logistic regression analyses were performed to identify factors associated with antibiotic self-medication by controlling for the effect of potential confounding variables. P-value of < 0.05 was set as significant.

Results

Socio-demographic characteristics of the students

Out of 422 questionnaires distributed to the respondents, 407 were filled consistently and completely with response rate of 96.4%. Most (65.6%) of the respondents were males while the mean age of students was 21 (SD, 2.06) years with the majority (73%) being between 20 to 24 years. Majority (75.9%) of students were Orthodox by religion and only 21.6% of the students had monthly pocket money of greater than 500 Ethiopian Birr (ETB) (exchange rate: 1 USD = 19.82 ETB) (Table 1).

Prevalence of and factors associated with antibiotic self-medication

Of 407 study participants, 181(44.5%) had self-medicated with antibiotics in their lifetime while 112(27.5%) had practiced within the last three months. Approximately two-third (66.1%) of the respondents who self-medicated with antibiotics within the last three months were males.

Firstly, we analyzed the relationship between different antibiotic self-medication - associated factors in bivariate correlation analysis to identify risk factors related to antibiotic self-medication. Factors significantly associated with antibiotic self-medication in the bivariate analysis were included in a multivariate logistic regression model. Results from the multivariate logistic regression analysis revealed that being protestant (AOR = 2.26, 95% CI: 1.19-4.27) and follower of other religions (AOR = 3.26, 95% CI: 1.29-8.23) were significantly associated with antibiotic self-medication within the last three months compared to orthodox followers. Students who came from rural areas were less likely to self-treat with antibiotics than those who came from urban areas (AOR = 0.52, 95% CI: 0.32-0.86) (Table 1).

Table 2 indicates conditions and reasons for self-medication with antibiotics within the last three months among students of ACMU. The majority of ailments for which the students used antibiotics for self-medication were common cold and/or headache (43.8%), followed by cough (34.8%), abdominal pain (32.1%) and fever (24.1%). The most common reasons to practice self-medication with antibiotics were that the respondents had prior experience of treating a similar illness (69.6%), mild illness (43.8%) and did to avoid the long waiting time for medical services (36.6%).

Table 3 shows sources of supply and information for self-medication with antibiotics within the last three months in ACMU students. Drug retail outlets such as community pharmacies (83%) and drug shops (58.9%) were the two most common sources of antibiotics for self-medication. Prior experience (66.1%), recommendation by community pharmacists (44.6%) and leaflets (41.1%) were the three major sources of information for antibiotics self-medication. Amoxicillin (43.3%) was the most commonly used antibiotic for self-medication, followed by ampicillin (18.4%) and ciprofloxacin (12.9%) (Fig. 1).

Discussion

The study populations available in the campus during data collection were 1st, 2nd and 3rd year students while others were out of the campus for academic attachment. Therefore, study participants were selected from 1st, 2nd and 3rd year students of the selected departments proportionally.

This study investigated a lifetime and 3-month period prevalence rates of 44.5% and 27.5% for using antibiotics without prescription, respectively and highlighted patterns of use where amoxicillin was the most widely self-medicated antibiotic obtained mainly from community pharmacies. Conditions for which students self-medicated were common cold and/or headache, cough, abdominal pain and fever. Such practices were based on the common reasons of previous successful experience, mildness of the illness and saving time, while the major sources of information were prior experience, community pharmacists and leaflets.

A three-month period prevalence of self-medication with antibiotics in this survey is less than that of studies among university students in Northern Nigeria (56.89, 38.8%, 50.3%) [5,9,10], Sierra Leone (68.9%) [6], Ghana (70%) [7], Uganda (65.1%) [8], Sudan (76%) [12], India (62.67%) [24] and Southern China (47.8%) [15]. Some other studies on self-medication with antibiotics have focused on the general community and reported prevalence rates of 11.9% in South Ethiopia [11] and 74% in Sudan [13]. These differences could be because of the variation in the period of time in which self-medication with antibiotics practice was assessed, field of study and access of antibiotics for self-medication. The period of time over which self-medication with antibiotics assessed varies in different studies. For instance, the prevalence of self-medication with antibiotics was assessed in Nigeria [10] and Uganda [8] over a six-month and twelve-month period of time, respectively. A study in Nigeria indicated that the prevalence of antibiotic self-medication among students of health related faculties was high compared to students of non-health related faculties though they had knowledge on antibiotics, consequences of their misuse and hazards associated with self-medication [5]. Under the loose regulatory system, easy access to purchase antibiotics without prescription might have encouraged antibiotic self-medication practice [15]. On the other hand, enforcement of antibiotic policies in the developing world and then measures such as strict prescription policy might rather exclude the poor from accessing drugs, resulting in increased morbidity from otherwise treatable infections since access to health care services in developing countries is often limited [7]. Generally, it would be necessary in order to enforce strict antibiotic policies to decrease the risk of resistance. For example, the Chilean Ministry of Health has strictly restricted the purchase of antibiotics without medical prescription in Chile since 1999 and the action resulted in a 43% decrease in antibiotic use in the outpatient setting [25].

Religion of the study participants was considered to be significantly associated with self-medication with antibiotics. The possible explanation for the significant variation among these study populations could be related to spiritual healing from some illnesses rather than taking medications. Lower antibiotic self-medication rates were observed with the students who came from rural areas compared to those who came from urban areas. These findings are comparable with those of the studies conducted in Islamabad, Pakistan [26] and South India [27] where residents of urban areas were more likely to self-medicate as compared to the rural population. This could be explained by the fact that people in rural areas have limited information about modern drugs and access to these drugs, and usually self-treat with alternative traditional remedies. The study conducted in a selected

urban and rural district of Sri Lanka reported that the users of traditional medicine were considerably higher in the rural than in the urban [28]. The study also confirmed that the lower likelihood of self-medication in rural areas is because of less affordability of health care.

The disease conditions such as the common cold and/or headache, cough, abdominal pain and fever for which the study participants self-medicated. These are consistent with the results reported in a community based study carried out in South Ethiopia [11]. Interestingly, some studies reported sore throats as the most frequently cited reasons for self-treatment with antibiotics [15,29]. These conditions or symptoms are widespread health problems among people and this antibiotic self-medication practice is wide spread and may continue if proper measures are not taken. Past experience, mildness of the illness and avoiding long waiting time to get medical services were the major reasons for the students to self-medicate with antibiotics in this study. These findings are in agreement with those of studies conducted in different parts of Ethiopia [11,16,18,20,30,31], and Nigeria [9] and Sierra Leone [6]. People should be informed that previous antibiotics used are not always appropriate to use in future medical problems.

In the present work, the most common sources of information for antibiotic self-medication were prior experience, community pharmacists and leaflets. The previous study conducted in Mekelle also investigated that community pharmacists were the major sources of information for self-medication [18]. Amoxicillin was the most common antibiotic used for self-medication as reported in other studies [5,6,7,8,15,32,33]. The foremost source of drug supply in this survey was community pharmacies like in other studies [5,11,16,17,32,33]. These findings demonstrate that community pharmacists could play a key role in controlling the problem of irrational antibiotic use by involving in giving education to their clients about the drugs for self-medication and the hazards associated with self-medication with antibiotics and other prescription only drugs. They are encouraged to practice within the expected framework of their profession and sell over-the-counter drugs alone for self-medication purposes.

The principal limitation of this study is that the data were collected based on self-administered questionnaire which may introduce some bias in the behaviors of the students studied. The sample might also not be representative of the entire students of Mekelle University since only an Adi-haqi campus was purposefully included in the study. Despite the limitations, these findings indicate a need to educate university students regarding self-medication with antibiotics and its consequences.

Conclusion

Self-medication with antibiotics was common among the study sample, in which religion and prior residence of the students were associated with the practice. The study highlighted that community pharmacies were the major source of self-medicated antibiotics and the most widely used one was amoxicillin. Antibiotics were utilized widely to treat common cold and/or headache, cough, abdominal pain and fever. Such practice was based on the most common reasons of previous successful experience, mildness of the illness and saving time, and the usual sources of information were prior experience, community pharmacists and leaflets. People should be informed that previous antibiotics used are not always appropriate to use in future medical problems. Community pharmacists could play a crucial role in controlling the problem of irrational antibiotic use by practicing within the expected framework of their profession and educating their clients about the negative consequences of self-medication with antibiotics. Enforcement of antibiotic policies is necessary to decrease the risk of resistance by restricting the purchase of antibiotics without a medical prescription and taking measures regarding the practice.

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Table1. Socio-demographic characteristics and self-medication with antibiotics (SMA) within the last 3 months in ACMU students

Characteristics	n(%)	SMA within the last 3 months		Crude OR (95%CI)	P value	AOR¶ (95%CI)	P value	
		Yes, n(%)	No, n(%)					
Gender	Males	267(65.6)	74(27.7)	193(72.3)	1	-	-	
	Females	140(34.4)	38(27.1)	102(72.9)	0.97(0.61-1.54)	0.902	-	
Age	15-19	85(20.9)	27(31.8)	58(68.2)	1	-	-	
	20-24	297(73.0)	78(26.3)	219(73.7)	0.77(0.45-1.29)	0.317	-	
	25-31	25(6.1)	7(28.0)	18(72.0)	0.84(0.31-2.24)	0.721	-	
Religion	Orthodox	309(75.9)	72(23.3)	237(76.7)	1	1	-	
	Protestant	48(11.8)	20(41.7)	28(58.3)	2.25(1.25-4.42)	0.008	2.26(1.19-4.27)	0.013
	Muslim	30(7.4)	10(33.3)	20(66.7)	1.65(0.74-3.68)	0.224	1.38(0.61-3.12)	0.441
	Others	20(4.9)	10(50.0)	10(50.0)	3.29(1.32-8.22)	0.011	3.26(1.29-8.23)	0.012
Residence	Urban	257(63.1)	83(32.3)	174(67.7)	1	1	-	
	Rural	150(36.9)	29(19.3)	121(80.7)	0.50(0.31-0.81)	0.005	0.52(0.32-0.86)	0.010
Monthly pocket money (ETB)*	<250	159(39.1)	42(26.4)	117(73.6)	1	-	-	
	250-500	160(39.3)	38(23.8)	122(76.2)	0.87(0.52-1.44)	0.583	-	
	>500	88(21.6)	32(36.4)	56(63.6)	1.59(0.91-2.79)	0.103	-	
Year of study	First	171(42.0)	52(30.4)	119(69.6)	1	-	-	
	Second	127(31.2)	33(26.0)	94(74.0)	0.80(0.48-1.34)	0.403	-	
	Third	109(26.8)	27(24.8)	82(75.2)	0.75(0.44-1.30)	0.307	-	

¶ Adjusted for religion and residence, * Exchange rate: 1 USD = 19.82 Ethiopian Birr (ETB).

Table 2. Conditions and reasons for self-medication with antibiotics within the last 3 months in ACMU students (n = 112)

Characteristics	Frequency	Percentage
Condition for which antibiotics were self-medicated		
Common cold, headache	49	43.8
Cough	39	34.8
Abdominal pain	36	32.1
Fever	27	24.1
Diarrhea	22	19.6
Eye infection	17	15.2
Nasal congestion	16	14.3
Tooth ache	15	13.4
Sore throat	14	12.5
Others	20	17.9
Reason for antibiotics self-medication		
Prior experience	78	69.6
Minor illness	49	43.8
Avoiding waiting time	41	36.6
Cost-effectiveness	36	32.1
Others	24	21.4

Table 3. Sources of supply and information for self-medication with antibiotics within the last 3 months in ACMU students (n = 112)

Characteristics	Frequency	Percentage
Sources of supply for self-medication with antibiotics		
Community pharmacies	93	83.0
Drug shops	66	58.9
Friends/Family	33	29.5
Left over from previous prescription	32	28.6
Others	3	2.7
Sources of information for self-medication with antibiotics		
Prior experience	74	66.1
Pharmacists	50	44.6
Leaflet	46	41.1
Friends	32	28.6
Others	9	8.0

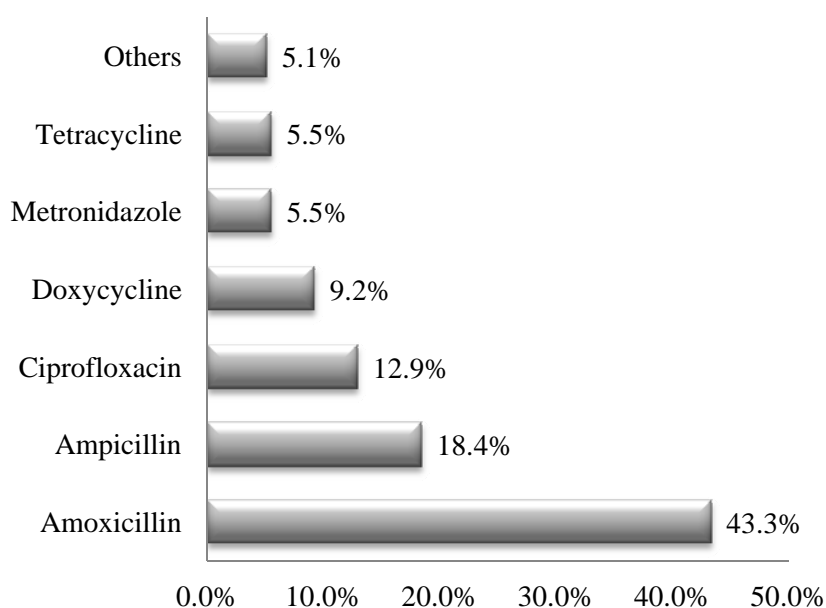


Fig. 1. Commonly used antibiotics for self-medication within the last 3 months in ACMU students