



## Self Medication with Antibiotics amongst Students of a Nigerian Tertiary Institution

Dr Igbiks Tamuno<sup>1</sup> and Ibrahim S. Mohammed<sup>2</sup>

<sup>1,2</sup>Department of Pharmacology, Faculty of Medicine, Bayero University, Kano, Nigeria

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### ABSTRACT

**Purpose:** Antibiotic access is made easier in developing countries by availability and poor regulatory and weak health systems. This study was designed to evaluate the pattern of antibiotic self medication amongst students of Bayero University Kano, North western Nigeria.

**Method:** Self administered, pretested, semistructured questionnaires were used to collect data from 354 students pursuing different courses of study and at different stages, using multistage **sampling**. **Different aspects of self medication were explored by the questionnaires.**

**Results:** Over seventy percent of the students studied were between the ages of 20-24 years with 65.5% of them being males. 24.9% were in second year of study while 11.9% were in their fifth year of study. 50.3% of the students studied had engaged in self medication with antibiotics in the last six months. Fever was the most common reason for use (48.4%). Metronidazole was the most common antibiotic involved (23.2%) while chloramphenicol (1.1%) was the least used. While 38.6% of respondents used antibiotics for self medication because they had used same drug for similar conditions. Patent medicine store was the most common source (64.4%) of antibiotics. 90% of respondents used antibiotics for less than 5 days.

**Conclusion:** A high prevalence of self medication and inappropriate use of antibiotics was found among students of the institution studied. This highlights the need for concerted efforts to strengthen and implement policies and legislation on prescription, sale and distribution of antibiotics.

**KEY WORDS:** self medication, antibiotics, patent medicine store.

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### INTRODUCTION

For every patient who receives a prescription from a doctor, at least seven others do without medical advice and obtain medicines from other sources (Walt, 1990).

Usage of antimicrobial agents in the developing nations centers around availability, regulatory control of quality, access, and an adequate and appropriate system of health care (Kunin et al, 1987).

Self medication is the use of drugs to treat self diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed drug for chronic or recurrent disease or symptoms. The buyer diagnoses his own illness and buys a specific drug to treat it (WHO, 2000).

A large number of people, when they fall sick, do not consult the physician. They either consult a drug store and obtain a medicine from the shelf, or consult a neighbour who may be having some tablets left over from his previous illness, and readily spares them. If you have a fever, cold, cough, constipation or indigestion, your friends or even total strangers volunteer advice on medicines to take like expert physicians. Almost everyone you meet has an excellent remedy for whatever ails you. In short, this is what is meant by self medication. May be most of the time nothing untoward happens on following such advice, but it can be dangerous (Barar, 2005).

Antibiotics consume a large proportion of the costs of the health care system in developing countries and according to the World Health Organization (WHO) estimates, up to 40% of health care costs may be for drugs alone (WHO, 1979). Studies in India, Bangladesh, Thailand and Tanzania estimate that 24% to 50% of the total pharmaceutical budget is spent on antimicrobial agents (WHO, 1980; Hossain, 1982; UNAPDI, 1978; Thamlitkul, 1983). These expenditures are much greater than those in West Germany or the United Kingdom, where expenditures for antimicrobial agents are 4% - 15% of the pharmaceutical costs (Kunin et al, 1987).

Health care is not uniformly available through the full geographical spectrum of the developing areas, and when it exists, it is not always used properly (Isturiz and Carbon, 2000). In a study in Burkina Faso, 53% of patients relied on pharmacies and drug sellers, 24% attended health care facilities, and 16% relied on traditional

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\*Corresponding Author: Dr Igbiks Tamuno, Department of Pharmacology, Faculty of Medicine, Bayero University, Kano, Nigeria. e-mail: igbikstamuno@yahoo.com Tel:+2348034511972

medicine and 7% on home care (Sauerborn et al, 1995). Even for acute illnesses, 36% of patients in Sri Lanka received self medication while 4% resorted to informal drug supply (Tudor et al, 1994).

Although deleterious, self medication with antimicrobial compounds is an extremely ubiquitous practice in developing countries for reasons of cultural tradition, convenience, accessibility, perceived savings and other benefits, with poor adherence being an ever-present consequence of self medication (Istiruz and Carbon, 2000).

A phenomenon causally related to this massive use and frequent misuse of antibiotics is the high rate of resistance of bacterial strains to antimicrobial agents. There is a clear relationship between the amount of a given antibiotic used and the incidence of bacterial resistance (Wolff, 1993). Antibiotics are unusual drugs in that they treat communities as well as the individuals who take them (Davis, 2002). Antibiotic resistance that helps the bacteria, pathogenic or otherwise, to survive presents a major difficulty to the physician trying to treat a serious infection. The arsenal of antibiotics may be used up quickly, leaving the patient vulnerable to drug resistant infections. Treatment of bacterial infections in the hospital and community has been altered drastically over the past few decades with the emergence of pathogenic organisms that are no longer susceptible to our most commonly prescribed antibiotics. Not only are hospital stays prolonged, but medical expenses have increased because of the need to use the newer, more costly antibiotics. The need for two or more drugs where formerly one would have been sufficient calls for additional expenses. Despite the best efforts, deaths occur from multiple resistant, unresponsive bacterial infections and the prevalence of resistance is a direct consequence of antibiotic use in man (Davis, 2002).

Resistance to commonly used antimicrobial drugs is remarkably high in countries where antibiotics are not restricted (O'Brien, 1992). The problem of worldwide resistance to antimicrobial drugs has clearly reached crisis proportions (Kunnin, 1993). The global spread of antibiotic resistant gonococci, meningococci and pneumococci presents serious life threatening problems. In developing countries, social conditions associated with poverty, overcrowding and poor hygiene favour transmission of plasmid mediated resistant organisms. The ease of worldwide travel encourages spread throughout the global ecologic system. Antibiotic resistance in developing countries causes a catastrophic increase in the medical and socio economic burden of untreatable infectious diseases (Wenzel and Kunnin, 1994).

The socio demographic determinants of self medication are age, gender, occupation, educational level, marital status, religion, place of residence, race, income and culture (Afolabi, 2008). In Nigeria, the prevalence of self medication is thought to be high, usually attributed to the fact that most drugs can be obtained from the pharmacies without prescription. As a result, minor illnesses are treated with antimicrobials which have a potential to harm the individual as well as the society at large (Kunnin, 1993).

Studies on pattern of antibiotic self medication and its associated factors should be of interest to public health practitioners due to the dangers posed to the individual and society at large, more so in a country where the literacy level and regulation of drug use are on opposite ends of the spectrum.

This study was therefore designed to evaluate the pattern of antibiotic self medication amongst students of Bayero University, Kano, a Nigerian University located in the North Western region of the country. The study examined the demographic characteristics, the types of antibiotics commonly involved, the sources of the drugs, the symptoms for which the drugs were used, the duration of use of these drugs as well as the reasons for which these students engaged in antibiotic self medication.

## METHODS

The study was in the main a cross sectional pretested questionnaire based study. Self administered pretested semi structured questionnaires were used to collect data from 354 students selected by multi stage sampling technique. The questionnaires consisted of both closed and open ended questions. The information requested included social demographic variables, like age, gender and level of study. The lead question was 'Have you practiced self medication with antibiotics in the last 3 months. Three months was chosen because we believe that recall of medication use would be reliable within that time frame. Other questions were on conditions for which antibiotics were taken, frequency of different antibiotics taken and the reasons for self medication. The names of the antibiotics were asked as well as the sources of the drugs, length of course of treatment and whether the course of treatment was completed or not and if not, the reasons for not completing the course of treatment. Some commonly used antibiotic drugs for systemic use were included in the questions. The questionnaires were randomly distributed to the students whose groups had been selected using multi staged sampling. The participating students were selected from three campuses of the university, studying courses in different faculties.

Filling and returning the forms was taken as consent to participate in the study. The study was approved by the ethical committee of the Aminu Kano Teaching Hospital which serves as the teaching hospital for the university in which the study was done.

The returned questionnaires were later sorted out and the information extracted. The SPSS statistical software version 16 was used for the analyses using mainly descriptive statistics. Chi square was used for associations where necessary with level of significance put at 0.05. Simple percentages were used in the presentation.

## RESULTS

460 questionnaires were distributed to the students but 354 responded giving a response rate of 88.5%. The demographic characteristics of the respondents are shown in Table I. The distribution showed that 249 (70.3%) students were between the ages of 20 and 24 years with 232 (65.5%) of them being males and 122 (34.5%) females. 88 (24.9%) were in their second year of study while 138 (39%), and 42 (11.9%) were in fourth and fifth year of study respectively. First year students were not included in the study because they were just arriving for registration at the university during the period of the study. Table II shows the pattern of antibiotic self medication. 50.3% of the respondents admitted to have engaged in self medication with antibiotics in the last 6 months. There was no significant association between self medication, and gender or level of education amongst the study population ( $P>0.05$ ). Fever was the commonest condition for which students used antibiotics as 48.4% of respondents used an antibiotic for fever. This was followed by diarrhoea, headaches, catarrh, throat ailments and cough. The most common antibiotic used for self medication was metronidazole (23.2%), followed by Ampicillin-cloxacillin (17.0%), then Tetracycline (14.1%), Amoxicillin and cotrimoxazole (13.3% and 13.6% each), Ciprofloxacin (13.6%), Ampicillin (5.1%), Amoxicillin Clavulanate (4.0%) and Chloramphenicol (1.1%). Table 3 shows some utilization characteristics including reasons for self medication, place where drugs were procured, length of use and completion of treatment course.

Nearly forty percent (38.6%) of the respondents used antibiotics for self medication because they had used same drug for similar conditions while 107(30.3%) said they used antibiotics for self medication because they thought their illness was mild. 29(8.2%) of respondents gave reasons of unavailability of time to go to hospital and someone urging them to use the drug. For 27(7.6%) of the respondents, they used antibiotics for self medication because the drug was available in the medicine/drug cabinet at home while no money for hospital bill was the reason why 10(2.8%) of respondents self medicated with antibiotics. 18(5.1%) of respondents engaged in antibiotic self medication because they had no confidence in doctors and other health workers.

Patent medicine stores were the most common (64.4%) single source of antibiotics used by the respondents followed by Hospital pharmacy (16.1%). 2.2% of respondents used antibiotics left over from previous hospital visits, while 1.4% of responding students got the drugs from friends or family.

Over 90% of respondents used antibiotics for less than 5 days while 6.5% used it for between 5 and 9 days. In spite of the above facts, 54.8% of the respondents claimed to have completed their course of treatment each time antibiotics were prescribed for them by clinicians. No significant statistical association was found between the educational level of the students and the length of treatment course ( $P>0.05$ ).

On why students did not complete their course of antibiotic medication when prescribed by doctors, 62.4% of respondents said they stopped the medication when they felt they had recovered while 5.6% of respondents said they did not complete their course because they lost interest in the medication. 21.5% of respondents did not say why they did not complete their course of medication.

TABLE 1: CHARACTERISTICS OF RESPONDENTS

Characteristics	No. of Subject n = 354	%
<b>Age (Years)</b>		
15 - 19	12	3.4
20 - 24	249	70.3
25 - 29	84	23.7
30 - 34	9	2.5
<b>Educational Level (Year of Study)</b>		
200	88	24.9
300	86	24.3
400	138	39.0
500	42	11.9
<b>Sex</b>		
Male	122	34.5
Female	232	65.5

TABLE II: UTILIZATION OF SELF MEDICATION

Characteristics	Frequency	Percentage
<b>a-Self Medication in last 6 months</b>		
Yes	178	50.3
No	176	49.7
<b>b- Condition for which Antibiotics was taken</b>		
<b>Fever:</b>		
No	183	51.6%
Yes	171	48.4%
<b>Headache</b>		
No	252	71.2%
Yes	102	28.8%
<b>Body Pain</b>		
No	319	90.2%
Yes	35	9.8%
<b>Tooth Ache</b>		
No	311	88.0%
Yes	43	12.0%
<b>Catarh</b>		
No	258	72.8%
Yes	96	27.2%
<b>Cough</b>		
No	288	81.5%
Yes	66	18.5%
<b>Throat Ailments</b>		
No	269	70.1%
Yes	85	23.9%
<b>Diarrhoea</b>		
No	219	62.0
Yes	135	38.0
<b>Other Conditions:</b>		
Boils	76	21.5
Ear Ache	35	10.0
Eye Discharge	32	9.0
Skin Infection	50	14.1
Typhoid	32	9.0
Tonsillitis	46	13.0
Ulcer	35	10.0
GITDisturbance	32	9.0

TABLE III: FUTHER UTILIZATION OF ANTIBIOTICS SELF MEDICATION

Characteristics	Frequency	Percentage
<b>a-Antibiotics taken for Self Medication</b>		
Amoxicillin	47	13.3
Ampicillin	18	5.1
Ampicillin-cloxacillin	60	17.0
Amoxicillin-clavulanate	14	4.0
Chloramphenicol	4	1.1
Ciprofloxacin	48	13.6
Metronidazole	82	23.2
Cotrimoxazole	48	13.6
Tetracycline	50	14.1
		100%
<b>b- Reasons for Self Medication</b>		
I have used the same drug for similar condition	136	38.6%
My Illness was mild	107	30.3%
No Confidence in Doctors and Other Health Workers	18	5.1%
No money for hospital bills	10	2.8%
No time to go to hospital	29	8.2%
Someone told me to use the drug	29	8.2%
The drug was available in the medicine/drug cabinet	27	7.6%
<b>c- Place where Self Medication was obtained:</b>		
Community Pharmacy	49	14.0%
Hospital Pharmacy	57	16.1%
Patent Medicine Store	228	64.4%
Used left over from previous hospital visit	8	2.2%
Got the drug from friends or family	5	1.4%
<b>d- Length of Course of Treatment:</b>		
< 5 days / 3 – 5 days	319	90.1%
5 – 10 days	23	6.5%
10 – 14 days	12	3.3%
<b>e- Students that Completed Their Course of Treatment:</b>		
Completed	193	54.5%
Not Completed	161	45.5%
<b>f- Reasons Why Students did not Complete Course of Medication:</b>		
Didn't say why	76	21.5%
Drug was too strong	9	2.5%
Felt worse	13	3.7%
Insufficient Fund	9	2.5%
Lost Interest	20	5.6%
Recovered	221	62.4%

## DISCUSSIONS

The prevalence of antibiotic self medication amongst students of Bayero University, Kano, Nigeria is considerably high at 50.3%. Similar findings have been reported in some other Universities in Nigeria (Akinyede and Banjo, 2001; Olayemi et al, 2010; Femi-Oyewo et al, 2002). These findings are in tandem with the established high prevalence of self medication in the general population in Nigeria. Studies have reported figures as high as 95 – 98% of the studied population admitting to have engaged in self medication in Nigeria (O'Brien, 1992). This is in sharp contrast with reports from Turkey (Ilhan et al, 2009), where 19.1% prevalence was reported in antibiotic self medication among primary care attendants. In other studies in European countries, antimicrobial self medication were found to be much lower than 10% in each of 19 European countries spread across east, west, north and southern Europe (Grigoryan et al, 2006). These findings suggest how much needs to be done in tackling the issues of drug administration, distribution and control in developing countries including Nigeria. Liu and Coworkers had detected antibacterial activity in the urine of more than 55.2% of Taiwanese patients visiting an emergency room, suggesting that they had recently ingested antimicrobials (Liu et al, 1999). In a follow up study, patients who had self medicated with antibiotics were less likely to be correctly diagnosed for infections or non-infectious disease (Liu et al, 2001). Studies including those quoted above had shown a strong relationship between education, poverty and antibiotics self medication (Akinyede and Banjo, 2001). However, this study, conducted amongst University students whose level of education by the standards of the developing world can be said to be good, and who have unhindered access to well equipped medical centres on campus and within the city of Kano, suggests, like other studies had done that abuse of prescription medication including antibiotics persists among educated patients and in those who reside in areas with better access to drugs (Wayland, 2004; Parimi et al, 2002; Okeke and Lamikanra, 2003).

Fever, diarrhoea and headaches constitute the disease symptoms/conditions for which antibiotics were most commonly used in this study while 14.1% of responding students used antibiotics for skin infections. This finding is not much different from those of a similar study in Nigeria (Akinyede and Banjo, 2001) and supports the assertion of Pradervant (1984), that in developing countries, antibiotics are viewed as wonder drugs capable of healing a wide variety of illnesses ranging from gastro intestinal disorders to headaches. These are common symptoms among many populations and this practice is wide spread and may continue if far reaching containment measures are not taken.

Metronidazole was the most commonly used antibiotic drug in this study while Chloramphenicol was the least commonly used antibiotic having a frequency of only 1.1% use. In a similar study in Nigeria (Olayemi et al, 2010), penicillins, particularly Ampicillin and Ampicillin-Cloxacillin combination were more frequently used ahead of metronidazole for a variety of conditions by people who engaged in self medication. However, as the use of these agents is not guided by any biomedical knowledge, virtually any antibiotic could do for any ailment (Vander Geest and Hardon, 1990). The broad spectrum of these agents however indicates some degree of correlation with assumed knowledge of infections in these populations (Akinyede and Banjo, 2001).

In this study, 90.1% of the respondents used antibiotics for less than 5 days, while only 54.5% of antibiotics self medicating students completed their course of treatment when antibiotics were prescribed for them. Not surprisingly, 62.4% of them gave recovery from the ailment as their reasons for not completing the course of antibiotics prescribed for them by clinicians. These practices are symptoms of a health care context in which drug distribution is uncontrolled and in which people use drugs according to their own ideas concerning efficacy (Vander Geest and Hardon, 1990). In societies in which drug effectiveness is often equated with the rapidity of response, the quick and dramatic impact of antibiotic therapy is particularly valued (Tudor et al, 1994). The fact that only a limited number of doses of antibiotics are prescribed and purchased by patients can reflect cultural preferences. In her case study of drug usage in an urban area in El Salvador, Ferguson (Ferguson, 1981) reports that the most frequent number of pills prescribed or purchased was four, a number with ritual significance in the community. The fact that many patients do not complete a full course of antibiotics may be derived from a cultural belief that drug use should be stopped when symptoms subside (Justice, 1986), or to save money. People sometimes accommodate their medical demands to their financial needs and use it to rationalize their purchase of too small quantities of medicines. Van Geest reported a young man suffering from a venereal disease who bought two tablets of penicillin because he did not have more money and "two is better than one" (Vander Geest and Hardon, 1990).

Over thirty eight percent of respondents in this study said they had used the same drug for similar conditions and gave that as their reason for antibiotics self medication while 30.3% used antibiotics because their ailment was mild. In 7.6% of students studied, the drug was available in their cabinet. These practices are closely related to the practice of stopping medication on thoughts of being well and in spite of the prescription

and advice from the doctor. Problems of non compliance are associated with this practice of saving drugs for later use. Up to 41% of patients studied in Italy saved part of their prescribed drugs for future use, while 4% of British patients studied were reported to exhibit this behavior(Grigoryan et al,2009); a behaviour that is more widespread in the developing world with its attendant consequences on antibiotic drug resistance and economic costs. Patients have been known to store antimicrobials from uncompleted courses , even beyond the expiration date and later self administer.

From this study, the major source of procurement of antibiotics was the patent medicine store (64.4%) followed by hospital pharmacy (16.1%) and community pharmacy (14.0%).

This was consistent with reports from previous studies in Nigeria(Afolabi,2008) and outside(Ferguson,1991). However, Akinyede and Banjo in 2001 reported community pharmacies as the major source of purchase of antibiotics. The patent medicine stores and dealers are usually closer to the grassroots and are ubiquitous, filling gaps created by the limited number of qualified pharmacists in a developing country like Nigeria.

In developing countries including Nigeria, drugs can be obtained from unsanctioned stall keepers, itinerant vendors, hawkers and purveyors of other materials who are often the first point of call for patients(Djimide et al,1998) . Drug Vendors (also referred to as patent medicine sellers) are licensed to sell prepackaged non prescription antimicrobials such as antimalarials ,but not to dispense or offer drug treatment advice. Patent medicine sellers often hold similar stock and conduct similar activities as pharmacies or hospitals, including dispensing, diagnosis, parenteral drug administration and patient care(Okeke et al,1999).while the activities of unsanctioned and untrained providers should be neither condoned nor ignored, it must be stated that many unjustified antimicrobial prescriptions come from sanctioned providers exacerbated by competitive pressure from unofficial providers(Bhutta and Vitry,1997).

On the whole, inadequate regulation of the antibiotics supply has important consequences for resistance control, at the individual and community levels.

### STUDY LIMITATIONS

As with all self reported data, results of this survey have the potential for recall bias, under reporting, or over reporting.

To reduce recall problems, we attached a list of the most commonly used antibiotics in the region to the questionnaires. To reduce and possibly discourage under reporting of self medication, the questions about drug use were formulated in a neutral way in which the source of the drug could be chosen from 5 predefined sources.

### CONCLUSIONS

This study revealed a high prevalence of antibiotic self medication amongst students in the University studied. It also showed inappropriate use of antibiotics supporting reports from other studies before it. It therefore highlights the need for serious efforts by all stakeholders in the health sector to take appropriate steps to strengthen the policies and legislation governing the prescription, sale and distribution of antibiotics to prevent its deleterious effects on the individual, the economy and medical world as a whole. In Nigeria, laws on over the counter availability of antibiotics should be strictly enforced.

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