# Antibiotics self-medication among medical students in a new medical college at Abubakar Tafawa Balewa University Bauchi, Nigeria

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## Abstract

Life as a medical student is often full of stress which could be physical, social, emotional and economical, especially in developing countries. Of recent, there has been an increased effort to combat self-medication which has remained a global public health burden since antiquity. Trainee health workers are particularly vulnerable to engage in self-medication practice which has remain a great panacea mitigating the efforts to combat resistance to common antibiotics in communities. This study aims to assess antibiotics self-medication among undergraduate medical students in Abubakar Tafawa Balewa University, Bauchi Nigeria. An exploratory cross-sectional study was conducted at college of medical sciences Abubakar Tafawa Balewa University Bauchi between June and July 2018. First and second year registered undergraduate medical students were specifically enrolled in the study. A sample size of 61 participants was determined by using a single population proportion formula and a close ended 25 items self-administered study tool was developed and piloted following a review of the relevant literature. All responses were analyzed using SPSS Version 21 and STATA Version 13 software for statistical analysis. A total of Eighty-one (81) medical Students were enrolled in the study. There were 39 (48.1%) males and 42 (51.9%) females. The median age among all respondents was 20 years. 41% of all the students reported having self-medication. (22) 27.2% of the respondent's reasons for self-medication was "Doctors gives same drug", for (20) 24.7% "the disease was mild", while (16) 19.7% "knew the drug to take", while (9) 11.1% "saves time" in self-medication and (2) 2.5% said it "saved cost". On logistic regression, gender remains the statistically significant explanatory variable, Wald Chi-square test 6.050 odds ratio 2.019 (P-value: 0.0014). The prevalence of SM among medical students is high in among Medical Students in ATBU Bauchi Nigeria. Targeted campaign programs to decrease SM among medical students in North East Nigeria as a whole, are required. Enforcement of laws and policies on un-prescribed drugs and continuous monitoring of dispensaries/drugstores and other outlets to issue drugs only on prescription are necessary to reduce self-medication.

## Introduction

It has been a common culture among physicians and medical students to treat their medical ailments instead of subjecting themselves to formal care by another professional colleague even when physicians expects patients to subject themselves for medical care.[1] The practice of Self-medication (SM) by health care providers is a potential source of occupational hazard.[2] This has prompted interest in studying the relationship between health literacy and SM practice,[3] which ironically has been defined as the act of taking drugs without the prescription of a legally qualified medical or health care provider.[4] Antibiotics self-medication (ASM) specifically is being widely practiced globally with varying negative consequences. Although SM has been described elsewhere in the literature as a component of "self-care" and thus with potential benefits if used responsibly,[5] whereas, self-care only involves use of over the counter medications which are lawfully used without being prescribed to treat self-perceived symptoms.[6] ASM on the other side, involves mainly the use of prescription only antibiotics medicine, inappropriately by individuals and usually causing huge public health challenges.[7]

ASM among both medical care providers and future medical care providers (Students) has been a great source of global public health dilemma in recent years.

Studies have reported the prevalence of ASM among undergraduate medical students in particular ranging from 20-100% underscoring the magnitude of the public health challenges it poses.[8] Nigeria, is listed among resource limited countries which are shown to have higher proportion of inappropriate antibiotics users compared with industrialized nations.[9] In addition, currently there is no nationally adapted definition of SM as well as ASM. Furthermore, gaps in legislations regulating the availabilities of prescription medicine accentuate access to these drugs through patent medicine stores. In a recent community-based study in Lagos, SM was found to be 93% among the respondents,[10] while 96.2% of physicians in Nigeria were also shown to practice SM.[11] Despite the relatively high reported prevalence of SM from community-based studies and among health care providers in Nigeria, to the best of our literature review there has been no studies on prevalence of antibiotics SM among medical students in Nigeria. This study therefore is aimed at providing the prevalence and knowledge of effects of antibiotics SM among medical students in college of medical sciences ATBU Bauchi Nigeria.

## Materials and Methods

An exploratory cross-sectional study was conducted at College of medical sciences Abubakar Tafawa Balewa University Bauchi between June and July 2018. The

study was targeted at all medical students in the college of medical sciences of the University.

First and second year registered undergraduate medical students in the study area were specifically enrolled in the study. The sample size was determined by using a single population proportion formula and considering the following assumptions: Prevalence (p) KAP of self-medication 50%, (Z) = standard normal distribution value at 95% confidence level of $Z\alpha/2 = 1.96$ and margin of error (d) = 5%.

$$N = \frac{(Z\alpha/2)^2 \times P (1-P)}{d^2}$$

$$n = \frac{(1.96)^2 \times 0.5 (1-0.5)}{(0.05)^2}$$

$$n = 215$$

The final sample size was determined as follows using correction formula.

$$nf = no / [1 + no/N]$$

where nf = the final sample size; no = initial sample size which is 215 and N = number of medical students in Abubakar Tafawa Balewa university Bauchi State, Nigeria.

$$nf = (215/215) / [1+86] = 61 \text{ students}$$

A close ended 25 items self-administered study tool was developed following a review of the relevant literature. The study tool was divided into three sections: i) Respondents' biodata; ii) Antibiotics Self-Medication Behavior; iii) Knowledge about antibiotics use and its effects.

## Study tool validation

### Unidimensionality

Structural Equation Modeling was conducted post hoc using STATA 13. A pooled measurement method was used. Items deletions method was used, starting with items that had lowest loading. Model estimations were repeated until all factors were loaded with values above 0.5 (as recommended for modified/new tool) to attain unidimensionality.[12]

### Validity

*Content and face validity*

Five selected respondents were asked to comment about difficulties in answering the questionnaire, length of the items, tautology, ambiguity and depth of the thoughts in construction of the questionnaire items.

Responses from the pilot study were used to effect necessary corrections in the wordings of the questionnaire.[13]

*Discriminant validity*

This was achieved in the final model when all correlations between variables were less than 0.85. Hence there is no collinearity.[14]

### Reliability test

*Internal reliability*

Cronbach's alpha was calculated to measure the internal consistency ("reliability") of the study tool using SPSS software. A Cronbach's alpha of 0.741 signifies strong correlation between variables. There should be no significant change in "Cronbach's Alpha if Items are deleted" consistently in items assessed.[15]

*Constructs reliability*

To achieve this, a CR value was calculated. A CR value greater than 0.6 is required to ensure construct reliability is achieved.[16]

### Data collection

Data collections were done by issuance of self-administered respondent's questionnaire by trained research assistant. Responses were obtained on the spot from consenting participants.

### Data analysis

All responses were entered into spread sheet for data cleaning and subsequently transferred into SPSS version 21 and STATA version 13 software for statistical analysis. Respondents' demographic profile were summarized using frequency table followed by prevalence rates and proportion. Logistic regression was used to explore relation between SM practice as dependent variable with other construct domains as independent variables.

Ethical approval was obtained from the College of Medical Sciences, ATBU and informed consent from the respondents. All respondents were assured free will to participate or not in the study. They were further assured that all information provided will remain anonymous. Where respondents chose not to participate, they were assured no harm will result from their decision.

## Results

### Socio demographics of respondents

A total of Eight-one (81) medical Students were enrolled in the study. There were 39 (48.1%) males and 42 (51.9%) females. The median age among all respondents was 20 years which fell within the

first category of 15-20 years. More than half of the respondents were year one (1) students of the university with 55 (67.9%),

**Table 1. Socio-demographic characteristics of the studied respondents.**

| Variables | Frequency | Percentage (%) |
|---|---|---|
| **Gender** | | |
| Male | 39 | 48.1 |
| Female | 42 | 51.9 |
| **Age** | | |
| 15-20 | 63 | 77.8 |
| 21-25 | 16 | 19.8 |
| 26-30 | 1 | 1.2 |
| 31-above | 1 | 1.2 |
| **Level of Study** | | |
| 100 Level | 55 | 67.9 |
| 200 Level | 26 | 32.1 |
| **Marital Status** | | |
| Married | 3 | 3.7 |
| Single | 78 | 96.7 |
| Divorced | 0 | 0 |
| **Tribe** | | |
| Hausa | 78 | 96.3 |
| Yoruba | 2 | 2.5 |
| Igbo | 1 | 1.2 |
| Others | 0 | 0 |
| **State of origin** | | |
| Adamawa | 1 | 12 |
| Bauchi | 57 | 70.4 |
| Borno | 2 | 2.5 |
| Gombe | 2 | 2.5 |
| Kaduna | 1 | 1.2 |
| Kano | 2 | 2.5 |
| Kastina | 3 | 3.7 |
| Kwara | 1 | 1.2 |
| Nasarawa | 2 | 2.5 |
| Osun | 1 | 1.2 |
| Taraba | 5 | 6.2 |
| Yobe | 2 | 2.5 |
| **Mothersage** | | |
| Do not know the age | 13 | 16.0 |
| Deceased | 5 | 6.2 |
| 30-40 Years | 20 | 24.7 |
| 41-50 Years | 33 | 40.7 |
| 51-60 Years | 9 | 11.1 |
| 61-70 Years | 1 | 1.2 |
| **Fathers age** | | |
| Do not know the age | 12 | 14.8 |
| Deceased | 8 | 9.9 |
| 30-40 Years | 1 | 1.2 |
| 41-50 Years | 11 | 13.6 |
| 51-60 Years | 32 | 39.5 |
| 61-70 Years | 16 | 9.8 |
| 71 and above | 1 | 1.2 |
| **Mothers highest qualification** | | |
| Primary | 7 | 8.6 |
| Secondary | 20 | 24.7 |
| Tertiary | 39 | 48.1 |
| Islamic | 15 | 18.5 |
| **Fathers highest qualification** | | |
| Primary | 2 | 2.5 |
| Secondary | 4 | 4.9 |
| Tertiary | 70 | 86.4 |
| Islamic | 5 | 6.2 |

while only 26 (32.1%) were year two (2) students of the university. There were more single respondents (78) 96.7% than the married (3) 3.7%. Majority of the respondents (78) 96.3% were Hausa by tribe while the

remaining (2) 2.5% and (1) 1.2% were Yoruba and others respectively. Approximately, (57) 70.4% of the respondents were Bauchi State indigenes while the remaining where from Taraba (5) 6.2%, Kastina (3) 3.7%, Borno, Gombe, Kano, Nassarawa and Yobe States were (2) 2.5% respectively and Adamawa, Kwara, Kaduna and Osun states were (1) 1.2% respectively. About 33 (40.7%) of the respondents' mothers Age were 41-50 years while (13) 16% Do not know their mothers age, (5) 6.2% of the respondents' mothers were Deceased and (20) 24.7% were within the 30-40 years and (9) 11.1% were 51-60 years. Slightly below average of the respondents Fathers age fell within 51-60 years (32) 39.5% while (12) 14.8% do not know their fathers age, (8) 9.9% of the respondents' fathers were Deceased, (16) 9.8% were 61-70 years and (1) 1.2% were 30-40 years and 71 years and above respectively. Lastly, less than average of the respondent's mother's highest qualification was (39) 48.1% tertiary education, (20) 24.7% had secondary education, (15) 18.5% had Islamic education and (7) 8.6% had primary education while most of the respondent's father's highest qualification were; tertiary education (70) 86.4%, Islamic education (5) 6.2%, Secondary education (4) 4.9% and primary education (2) 2.5% (Table 1).

Mean (±SD) self-medication was compared across different categorical variables (Table 2). There were two significant associations between the variables and self-medication after the analysis and the variables were Gender and Fathers age.

From Table 3, the analysis shows that, (22) 27.2% of the respondents' reasons for self-medication was that the Doctors gives same drug, (20) 24.7% said the Disease was mild, (16) 19.7% knew the drug to take,

(12) 14.8% had no response about their reasons while (9) 11.1% saves time and (2) 2.5% said it saved cost.

### Logistic regression predicting self-medication from gender

Table 4 shows the logistic regression coefficient, Wald test and odds ratio for each of the variables. Employing a 0.05 criterion of statistical significance, Gender had significant effect. The odd ratio for Gender implies that when holding all other variables constant, a male medical student is two (2) times more likely to practice self-medication more than a female medical student.

## Discussion

This study was conducted to serve as a basis for determining the prevalence self-medication among medical students and to provide baseline information and of knowledge of the effects of antibiotics among medical students in college of medical sciences ATBU Bauchi, North East Nigeria. Self-medication (SM) is the intake of drugs without professional advice to treat self-diagnosed symptoms, illness or emotional ailments.[7,17] SM also refers to any habitual use of substance or any exogenous influence by an individual to treat common conditions and perceived minor health problems such as fever, headache, sore throat, intestinal colic, cramps, cold, pains and infections with medicines that are approved and available without prescription.[6] The World Health Organization (WHO), on the other hand described Self-medication as a human behavior, in which a person takes drugs without professional advice to treat self-diagnosed symptoms or illness.[18] Drugs and substance for self-medication are commonly dispensed over the counter,[4] not consulted or prescribed by any physician are used for the treatment of common health issues at home. Several studies carried out in both developed and developing countries have shown that self-medication and inappropriate use of antibiotics is rampant among college students in which harm outweighs the benefit, and its inappropriate use may cause drug resistance, physical and mental health hazards and addicts which to some extent can influence professional decisions.[11,19] Previous studies have also shown that self-medication practice and antibiotics use are driven by a lot of deter-

**Table 2. Association between socio demographic variables and self-medication.**

| Variables | Mean(±SD) | P |
|---|---|---|
| Gender | | 0.019 |
| Male | 1.3846(0.5436) | |
| Female | 1.6429(0.5329) | |
| Age | | 0.881 |
| 15-20 | 1.5079(0.5350) | |
| 21-25 | 1.5625(0.6291) | |
| 26-30 | 2(-) | |
| 31-above | 1(-) | |
| Level of study | | 0.586 |
| 100 Level | 1.4909(0.5399) | |
| 200 Level | 1.5769(0.5778) | |
| Marital status | | 0.548 |
| Married | 1.6667(0.5774) | |
| Single | 1.5128(0.5523) | |
| Divorced | - | |
| Tribe | | 0.596 |
| Hausa | 1.5256(0.5518) | |
| Yoruba | 1(0) | |
| Others | 2(-) | |
| State of origin | | 0.103 |
| Adamawa | 1(-) | |
| Bauchi | 1.5965(0.5625) | |
| Borno | 1.5(0.7071) | |
| Gombe | 1.5(0.7071) | |
| Kaduna | 1(-) | |
| Kano | 1(0) | |
| Kastina | 1.67(0.5774) | |
| Kwara | 1(-) | |
| Nasarawa | 1.5(0.7071) | |
| Osun | 1(-) | |
| Taraba | 1(0) | |
| Yobe | 1.5(0.7071) | |
| Mothers age | | 0.082 |
| Do not know the age | 1.69(0.4804) | |
| Deceased | 1.6(0.5477) | |
| 30-40 Years | 1.7(0.6569) | |
| 41-50 Years | 1.3(0.4667) | |
| 51-60 Years | 1.5556(0.5271) | |
| 61-70 Years | 1.5185(0.5503) | |
| Fathers age | | 0.021 |
| Do not know the age | 1.75(0.4523) | |
| Deceased | 1.75(0.4629) | |
| 30-40 Years | 2(-) | |
| 41-50 Years | 1.2727(0.4671) | |
| 51-60 Years | 1.5625(0.6189) | |
| 61-70 Years | 1.25(0.4472) | |
| 71 and above | 2(-) | |
| Mothers highest qualification | | 0.852 |
| Primary | 1.2857(0.4879) | |
| Secondary | 1.55(0.5104) | |
| Tertiary | 1.5385(0.5547) | |
| Islamic | 1.533(0.6399) | |
| Fathers highest qualification | | 0.377 |
| Primary | 1.5(0.7071) | |
| Secondary | 1.75(0.50) | |
| Tertiary | 1.5143(0.5580) | |
| Islamic | 1.4(0.5477) | |

**Table 3. Reasons for self-medication.**

| Reasons | Response (%) |
|---|---|
| No Response | 12 (14.8) |
| Saves Cost | 2 (2.5) |
| Saves Time | 9 (11.1) |
| The disease is mild | 20 (24.7) |
| I know the Drug | 16 (19.7) |
| Same prescription is expected from the doctor | 22 (27.2) |
| Difficult to have permit | - |

**Table 4. Logistic regression predicting self-medication from gender.**

| Predictor | B | Wald chi-square | P | Odd ratio |
|---|---|---|---|---|
| Gender | -2 | 6.050 | 0.014 | 2.019 |

mining factors such as socio economic and demographic factors, lifestyle, level of education, field, advertisements,[5] advice from friends or relatives, readily available drugs.[20]

This study has established the prevalence of self-medication and knowledge of antibiotics use among medical students in North East Nigeria to be 41%. This finding is very close to the prevalence rate reported in the study carried out among medical students in India,[7] and lower than reported among medical practitioners in Ilorin, Nigeria by Fadare.[11] Some higher rates were also reported by Montgomery in Greece where more than 50% of the medical students reported self-treatment. and Egypt.[21]

Our study revealed that the prevalence is higher among male medical students (61%) than their female counterparts (16%). The study therefore demonstrates that male students are more active SM practitioners than female medical students. This was contrary to that reported by Sharma with female prevalence at 77.4% and similar to that reported by Banerjee and Bhadury (69%) and Gutema et al. (55%).[17,22,23]

Positive correlation was observed between ethnicity and self -medication. The Hausa tribe had the highest number of those who practiced self-medication with (39) 91.5% compared to other tribes. The study further showed that majority of the respondents who practiced SM were from Bauchi state compared to medical students from other States. These findings could be attributed to the higher number of Hausas and Bauchi students among study participants compared with non-Hausas and non-Bauchi state students. The study further shows relationship between age and practice of SM because the median age among all respondents was 20 years which fell within the first category of 15-20 years. There was close association between self-medication practices and younger age group as reported in previous studies.[24]

Although slightly more than half of the respondents in this were year one (1) students of the college 55 (67.9%). The SM prevalence was found to be higher among the first-year students compared with lower rate 26 (32.1%) found year two (2) students as similarly found in a previous study with more than half of study participants that practiced self-medication were first year medical students.[25]

Interestingly, this study revealed the major reasons for self-medication among the medical students was that physician gives same drugs (22) 27.2%, to another (20) 24.7% said the disease was mild, while (16) 19.7% felt they have good knowledge

of the drugs to take. As high as (12) 14.8% had no reasons for SM practice while (11) 13.6% said it saves time and cost.

## Conclusions

This study has for the first time established the prevalence of SM among Medical Students in North East Nigeria. The study shows males medical students being more active SM practitioners than female medical students. We found that SM and antibiotics use is more prevalent among first year medical students who just enrolled into university and drugs for SM can be purchased over the counter. Further studies are recommended to gain more understanding on the effects of self-medication practice among the medical students. Targeted campaign programs to decrease SM among medical students in North East Nigeria are required. Enforcement of laws and policies on unprescribed drugs and continuous monitoring of dispensaries/drugstores to issue drugs only on prescription are necessary to reduce self-medication among medical students.

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