

## Factors Influencing Self-Medication Practice Among Medical and Non-Medical Undergraduate Students of Olabisi Onabanjo University, Ogun State, Nigeria

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### Abstract

Practice of self-medication is largely influenced by individual perception and belief on effectiveness of the medicine to be administered by the patient to treat certain illness without concerting a medical practitioner. The main objective of this study was to examine the factors influencing self-medication practice among undergraduates of Olabisi Onabanjo University, Ago-Iwoye, Ogun State.

The study utilized a descriptive cross-sectional design. The study population were undergraduates; 4 faculties were randomly selected from 2 strata of faculties: medical (MS) and non-medical (NMS). Four hundred students were selected through a multistage sampling technique. Data was collected at using a validated questionnaire and analyzed using descriptive and inferential statistics.

Findings showed that the prevalence of self-medication among the undergraduates was 52.2%. Overall, the MS had higher predisposing ( $MS = 16.13 \pm 3.93$ ;  $NMS = 14.38 \pm 4.19$ ) and enabling factors ( $M = 9.83 \pm 2.92$ ;  $NMS = 9.58 \pm 3.20$ ) while the non-medical students had a higher level of reinforcing factors ( $MS = 8.28 \pm 2.77$ ;  $NMS = 9.35 \pm 4.08$ ). Course of study had no statistical relationship with practice of self-medication ( $F_{1,373} = 0.050$   $p = 0.824$ ). Practice of self-medication had significant relationship with predisposing ( $F_{1,373} = 2.047$ ;  $p = 0.006$ ), enabling ( $F_{1,373} = 3.416$ ;  $p < 0.01$ ) and reinforcing factors ( $F_{1,373} = 2.609$ ;  $p < 0.01$ ).

There is an urgent need for a multifaceted approach to tackle the issues identified as predisposing to self-medicated antibiotics in Nigeria. Appropriate, targeted and comprehensive public health education is needed to inform the public on the dangers of self-medication.

**Keywords:** Self-medication, Undergraduates, Adolescents, Abuse, Predisposing, Medical Students.

### Introduction

The response to a natural quest for wellbeing includes the self-diagnosis or administration of medication without prior medical consultations in the aspects of dosage, indications of side effects and duration of treatment. Self-medication, as a component of self-care, is considered to be a primary public health resource in health care system. According to the WHO guidelines, the act of practicing responsible self-medication can help prevent and treat diseases that do not require patients to seek medical consultation. This action can therefore reduce the increasing pressure on medical services for relief of minor ailments especially when resources are limited” (WHO, 2000). However, there are risks associated with self-medication which include lack of clinical evaluation of the condition by a health care

provider which could result in misdiagnosis and incorrect choice of medicines, delays in seeking proper treatments, use of excessive medicines or lower dosage and prolonged duration of use of medicines (Hughes, McElnay, Fleming 2001).

Although self-medication may prove useful when used judiciously, it is more often used erroneously, without proper guidance and rationale. This evidence was highlighted by a study conducted in Jordan, which showed that 67.1% of adults believed that antibiotics cure common cold and cough (Shehadeh, Suaifan, Darwish, Wazaify, Zaru & Alja'fari, 2012). It can also lead to incorrect self-diagnosis, delays in seeking appropriate care, dangerous drug interactions, risk of dependence, drug abuse, incorrect dosage and choice of medication. Nigeria stands out among the few countries of the world where drugs are freely displayed for sale in

unauthorized places such as markets, shops, roadside stalls, motor parks and other public places by individuals not duly licensed (Auta, et al, 2012). Studies have reported high prevalence rates of self-medication in Nigeria ranging from 92.3% in Lagos, (Ayanwale, Okafor & Odukoya, 2017), 80.4% in Zaria, (Olayemi, Olayinka & Musa, 2010) and 66.0% in Jos (Auta et al., 2012). However, rates among students are scarce.

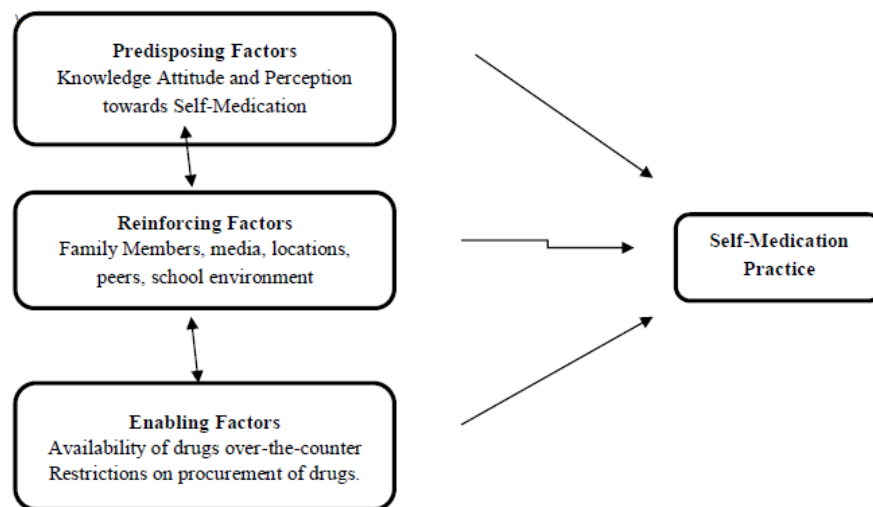
These beliefs that self-medication provides a cheaper and convenient alternative for treating common minor illnesses by individual themselves are valid. However, the problem of self-medication is that not all individuals have the knowledge of the medicines being used, the right indications, dosages, and duration of use as well as the side effects (KayalvlizhiI, 2001). Self-medication practices can result in adverse health effects that will require medical attention and this can further increase the burden and out-of-pocket expenses. Irresponsible or inappropriate self-medication practices may lead to adverse drug reactions, drug induced disease, drug interactions, drug dependency antibiotic resistance and waste of public resources (Al Khaja, Handu, James, Otoom, & Sequeira, 2006; Ullah, Khan, Ali, 2013).

The misuse of nonprescription drugs amongst students has becomes a serious problem. Substance use is a public health problem which is highly prevalent among young people. This evolving trend may have been aggravated by self-medication practice among young people in Nigeria. Young adults are more vulnerable to the practice of self-medication due to their low perception of risk associated with the use of drugs, knowledge of drugs, easy access to

internet, wider media coverage on related health issues, ready access to drugs, level of education, and social status. Self-medication increases the chances of illicit use of drug and drug dependency and most of all masking the sign and symptoms of underlying disease hence are complicating the problem, creating drug resistance and delaying diagnosis.

Individuals' perception of illness and incessant advertising, among others, have directly increased the prevalence of self-medication which accounts for about 2.9 - 3.7 % causes of death in hospitals as a result of adverse drug reactions (ADR) (Giardina, 2018). It has also been reported that drug use is influenced by the sociodemographic characteristics of drug consumers such as gender, morbidity, age but there is dearth on information on the patterns and determinants of self-medication among medical students in Nigeria.

The constructs of the research were adopted from the PRECEDE-PROCEDE (Predisposing, Reinforcing and Enabling Construct in Education/Environmental Diagnosis and Evaluation) model which was designed by Green, Kreuter, Deeds & Patridge in 1979 (Glanz, Rimer, & Viswanath, 2008). The notion behind PRECEDE model is that just like a in clinical examinations, a medical diagnosis must be made before treatment is commenced, so there must be an environmental or educational diagnosis before a tangible health program or intervention can be effective. Hence, this study used the constructs in assessing the factors which influence the practice of self-medication among undergraduates of Olabisi Onabanjo University, Ago-Iwoye, Ogun State.



**Figure 1.** Application of the Modified PRECEED Conceptual Model

## Materials and Methods

### Study design

The descriptive cross-sectional research design was adopted for the study. The study area is a university setting. The university is a state owned and the institution operates in Ago-Iwoye, Ogun State, Nigeria.

### Study population and size

The study population were all undergraduates of the Olabisi Onabanjo University, Ago-Iwoye, Ogun State. Sample size was estimated employing the Cochran sample size formula for estimation of a single proportion as described by Armitage and Berry (2001). Estimated size was 384 which was increased to 400 to cover for attrition and provide a robust analysis.

### Sampling

The multi-staged sampling technique was used for the selection of undergraduates in the specified university and the faculties were categorized into two strata of faculties: Medical and Non-medical groups by simple random sampling. The medical faculties were the health science related faculties such as medicine, pharmacy, dentistry and public health while the non-medical faculties were the faculties not related to any health-oriented courses such as Law, Administration, Education etc. Four faculties – two medical faculties (and two non-medical faculties - were randomly selected from the two groups by simple random sampling through balloting. A systematic sampling technique was employed in the selection of students from the various levels. However, an equal number from each level was drafted into the study.

### Data collection

The instrument for data collection was a semi-structured, participant-administered questionnaire which will solicit information on the demographic characteristics, knowledge on self-medication, self-medication practice, attitudes and perception towards self-medication.

### Measures

**Practice:** the students' practice of self-medication will be assessed with questions which was allotted one point per item.

**Predisposing Factors:** the knowledge of the students on self-medication was measured with a 7-item scale. The scale measured the participants' knowledge on what self-medication is, the types of drugs that are frequently used, the information that should be provided for medicines available for purchase over the counter etc. Each correct answer was scored one mark, otherwise zero. The total score was computed and converted to percentage. The computed score was grouped into low (0 – 5) and high (6 – 10) level of knowledge. The attitudes of the students to self-medication was measured and responses were presented with a likert scale which will be graded as Strongly Agree = 1, Agree = 2, Disagree = 3 and Strongly Disagree = 4. Some of the questions were negatively constructed hence, the grading was reversed for such questions. The responses for each perception subscale was computed to generate a total score for each participant with a maximum of 18 points.

**Enabling factors:** this section was measured with a likert scale which was graded as Strongly Agree = 1, Agree = 2, Disagree = 3 and Strongly Disagree = 4. Some of the questions were negatively constructed hence, the grading was reversed for such questions. The responses for each perception subscale was computed to generate a total score for each participant with a maximum of 21 points.

**Reinforcing factors:** this section was measured with a likert scale which was graded as Strongly Agree = 1, Agree = 2, Disagree = 3 and Strongly Disagree = 4. Some of the questions were negatively constructed hence, the grading will be reversed for such questions. The responses for each perception subscale was computed to generate a total score for each participant with a maximum of 18 points.

The data collected for the study were collated, entered and coded using the Statistical Product for Service Solutions (IBM SPSS™) version 23. Descriptive and inferential statistics were employed on the analysis of the data. The results generated were presented with frequency counts; percentages and the statistical level of significance for the inferential statistics was set at  $p < 0.05$ . Hypothesis was tested using inferential statistics such as Pearson Product Moment Correlation and Regression. Chi-Square were used to determine association between categorical variables; t-test to compare means of continuous variables.

## Results

Findings of the study showed that there were 11 (2.9%) students aged 0 – 25 years old while majority of the students were between the ages of 16 – 25 years. The mean±SD age of the students was 20.06±2.837 years. Seventy three percent (273) of the students were females while 101 (27%) were males (Table 4.1). There were 181 (48.4%) students who studied medical courses such as Pharmacy, Medicine, Biochemistry and Anatomy. Also, students from the non-medical courses were 193 (51.6%) in number. The distribution of the students according to their levels showed that only 6 (1.6%) were in 600 level, 86 (23%) students in 400 level and 55 (14.7%) in 100 level (Table 4.1). seventy-seven percent (288) of the students were Christians, 81 (21.7%) were Muslims and 5 (1.3%) were traditionalists. The ethnic distribution of the undergraduates showed that 291 (77.8) were from the Yoruba ethnic group while 51 (13.6%) undergraduates were from the Igbo group and 5 (1.3%) were from the Hausa ethnic group (Table 1).

Majority of the undergraduates (328; 87.7%) agreed that self-medication is the process of medicating oneself without a physician's advice while 46 undergraduates (12.3%) reported otherwise. Over half of the undergraduates (207; 55.3%) stated that they are aware antibiotics are one of the commonly used drugs for self-medication; 288 (77.0%), 167 (44.7%) and 67 (17.9%) undergraduates were aware of the use of pain relievers, cough syrups and allergy drugs respectively (Table 4.2).

Majority of the undergraduates (299; 79.9%) knew that self-medication especially of antibiotics may cause drug resistance. Likewise, 329 (88.0%) stated that the over-use of pain relievers may cause liver problems in the users. Three hundred and forty-one (91.2%) stated that they knew pregnant women had to consult with their physicians before taking any drugs. The knowledge of self-medication being an important component of self-care was reported by about half of the undergraduates (192; 51.3%) (Table 2).

The level of knowledge was assessed by computing a scale on 14-point ratings. The grouped results showed that among the medical students, 63 (34.8%) had a low level of knowledge while 118 (65.2%) had a high level of knowledge. While the combined mean±SD score of knowledge was 7.83±2.60, the medical students had a higher mean±SD (9.26±2.65) of knowledge compared to the non-medical students (6.48±1.70) (Table 3).

The attitudinal disposition was assessed using a 6-item scale. A quarter of the undergraduates (96; 25.7%) strongly agreed that they did not use non-prescribed medications even if they know someone who had taken it before while 72 (19.3%) and 56 (15.0) undergraduates disagreed and strongly disagreed respectively. Almost half of the students (181; 48.4%) agreed that they did have much time to visit health facilities because of the busy school schedule while 94 (25.1%) disagreed. About a third of the undergraduates (121; 32.4%) strongly agreed that they usually did not have serious illnesses which could require a doctor's visit while 144 (38.5%) agreed to have the same disposition. Over half of the undergraduates (69, 18.4%; 152, 40.6%) agreed that increased availability of information on the internet had helped them to make decisions about drugs to use. One hundred and seventy-three (46.3%) students agreed that they had adequate information about the drugs they usually take while 76 (20.3%) disagreed to having such disposition. Only 71 (19%) and 136 (36.4%) of the students strongly agreed and agreed respectively that they were capable of making the right choices about medicines. The level of attitudinal disposition was measured on an 18-point rating scale with a mean±SD of 7.40±3.39. The medical students had a mean±SD of 6.87±3.25 while the non-medical students had a slightly better mean±SD of 7.90±3.46 (Table 4).

One hundred and fifty-one medical students (83.4%) had negative attitudinal disposition to self-medication while 145 (75.1%) of the non-medical students exhibited same. The predisposing factors were computed on a 32-point rating scale and the combined mean±SD was 15.23±4.16.

**Table 1.** Sociodemographic Distribution of the Respondents

S/N		Frequency (N)	Percentage (%)
<b>1</b>	<b>Age</b>		
	0 – 15 years	11	2.9
	16 – 25 years	352	94.1
	26 – 35 years	9	2.4
	36 – 45 years	1	0.3
	46 years and above	1	0.3
	<b>Mean±SD</b>	<b>20.06±2.837</b>	
<b>2</b>	<b>Gender</b>		
	Male	101	27.0
	Female	273	73.0
<b>3</b>	<b>Course of Study</b>		
	Medical Students	181	48.4
	Non-medical Students	193	51.6
<b>4</b>	<b>Level of Study</b>		
	100	55	14.7
	200	102	27.3
	300	90	24.1
	400	86	23.0
	500	35	9.4
	600	6	1.6
<b>5</b>	<b>Religion</b>		
	Christianity	288	77.0
	Islam	81	21.7
	Traditional	5	1.3
<b>6</b>	<b>Ethnicity</b>		
	Yoruba	291	77.8
	Igbo	51	13.6
	Hausa	5	1.3
	Others	27	7.2

**Table 2.** Knowledge of Undergraduates on Self-medication

S/N		Yes	No
<b>1</b>	Self-medication is		
	a. The act or process of medicating oneself especially without the advice of a physician	328 (87.7)	46 (12.3)
	b. The act of using the same drugs a physician had once prescribed for similar ailment.	84 (22.5)	290 (77.5)
	c. The use of drugs purchased over-the-counter following a doctor's prescription	37 (9.9)	337 (90.1)
	d. The use of home-made drugs and herbs to treat ailments	91 (24.3)	283 (75.7)
<b>2</b>	Drugs which are commonly used for the act of self-medication are	207 (55.3)	167 (44.7)
	a. Antibiotics	288 (77.0)	86 (23.0)
	b. Pain relievers	202 (54.0)	172 (46.0)
	c. Malaria drugs	167 (44.7)	207 (55.3)
	d. Cough syrup	60 (16.0)	314 (84.0)
	e. Antidepressants	67 (17.9)	307 (82.1)
	f. Allergy drugs		

<b>3</b>	What type of drug information do you think should be made more readily known to consumers? a. Correct name of drugs b. Indication (need) for the drugs c. Dose, Frequency and duration of usage d. How to use the drug e. Side effects, contraindications and precaution f. Storage of drug at home	114 (30.5) 161 (43.0) 179 (47.9) 146 (39.0) 187 (50.0) 139 (37.2)	260 (69.5) 213 (57.0) 195 (52.1) 228 (61.0) 187 (50.0) 235 (62.8)
<b>4</b>	Self-medication, especially of antibiotics may cause drug resistance	299 (79.9)	75 (20.1)
<b>5</b>	Over-use of pain relivers may cause liver problems	329 (88.0)	45 (12.0)
<b>6</b>	Pregnant women need to consult their physicians before taking any drugs	341 (91.2)	33 (8.8)
<b>7</b>	Self-medication is a component of self-care	192 (51.3)	182 (48.7)

**Table 3.** Distribution of Undergraduates' Level of Knowledge

<b>Knowledge</b>	<b>Medical Students</b>	<b>Non-medical Students</b>	<b>Total</b>	<b>Maximum Points</b>
Poor (0 - 7)	63 (34.8)	161 (83.4)	224 (59.9)	14 points
Good (8 - 14)	118 (65.2)	32 (16.6)	150 (40.1)	
Total	181 (100)	193 (100)	374 (100)	
Mean±SD	9.26±2.65	6.48±1.70	7.83±2.60	

The medical students had a slightly higher mean±SD of 16.13±3.93 compared to the non-medical students (14.38±4.19) (Table 5). One hundred and one medical students (55.8%) had low level of predisposing factors to self-medication while 149 (77.2%) of the non-medical students had same. The level of enabling factors which influence the practice of self-medication was computed on a 21-point rating scale. The mean±SD of all the students was 9.70±3.06. The medical students had a mean±SD score of 9.83±2.92 while the non-medical students had a mean±SD score of 9.58±3.20 (Table 6). The distribution among the students showed that 95 (52.5%) of the medical students had a low level of enabling factors as influence to practice self-medication while 86 (47.5%) had a high level. Majority (119 (81.7%) of the non-medical students had a low level of enabling factors while 74 (38.3%) had a high level (Table 5). The level of reinforcing factors was computed on an 18-point rating scale. The mean±SD scores of the medical students' and non-medical students' level of reinforcing factors were 8.28±2.77 and

9.35±4.08 respectively (Table 5). Sixty-eight students (123) among the medical educational group had a low level of enabling factors which could contribute to the practice of self-medication while 58 (32%) students had a high level. On the other hand, 105 (54.4%) of the non-medical students had a low level of factors reinforcing self-medication and 88 (45.8%) had a high level.

Two hundred and seventy-six students reported to have ever used drugs which were not through a medical consultation while 26.2% (98) of the students reported otherwise. The most common reason for the practice of self-medication among the students was headaches (232; 62.0%) were minor illnesses. The types of drugs used in the past 3 months ranged from supplements (107; 71.4%), vitamins (137; 36.6%) and paracetamol (201; 53.7%). A total of 87 (48.1%) medical students had used a medication in the past three months without a prescription or medical advice while 95 (49.2%) non-medical students reported same (Table 6). the prevalence of self-medication among the undergraduates was 51.2%.

**Table 4.** Distribution of Attitudinal Disposition towards Self-medication

Attitudinal Disposition	Medical Students	Non-medical Students	Total	Maximum Points
Negative (0 - 9)	151 (83.4)	145 (75.1)	296 (79.1)	18 points
Positive (10 - 18)	30 (16.6)	48 (24.9)	78 (20.9)	
Total	181 (100)	193 (100)	374 (100)	
Mean ± SD	6.87±3.25	7.90±3.46	7.40±3.39	

**Table 5.** Distribution of Factors Influencing Self-medication among Undergraduates

Variables	Medical Students	Non-medical Students	Total	Maximum Points
Predisposing Factors				
Low (0 - 16)	101 (55.8)	149 (77.2)	250 (66.8)	32 points
High (17 - 32)	80 (44.2)	44 (22.8)	124 (33.2)	
Total	181 (100)	193 (100)	374 (100)	
Mean±SD	16.13±3.93	14.38±4.19	15.23±4.16	
Enabling Factors				
Low (0 - 10)	95 (52.5)	119 (81.7)	214 (67.2)	21 points
High (11 - 21)	86 (47.5)	74 (38.3)	160 (42.8)	
Total	181 (100)	193 (100)	374 (100)	
Mean±SD	9.83±2.92	9.58±3.20	9.70±3.06	
Reinforcing Factors				
Low (0 - 10)	123 (68.0)	105 (54.4)	228 (61.0)	18 points
High (21 - 30)	58 (32.0)	88 (45.6)	146 (39.0)	
Total	181 (100)	193 (100)	374 (100)	
Mean±SD	8.28±2.77	9.35±4.08	8.83±3.54	

**Table 6.** Self-medication Practice

Practice	Medical Students	Non-medical Students	Total
Use of Medicines without medical advice in past 3 months			
Yes	87 (48.1)	95 (49.2)	192 (51.2)
No	94 (51.9)	98 (50.8)	182 (48.7)
Total	181 (100)	193 (100)	374 (100)

## Test of Hypothesis

**H<sub>0</sub>1:** There is no significant difference between the self-medication practices of medical and non-medical students of Olabisi Onabanjo University.

An ANOVA test was conducted to determine if the practice of self-medication was mediated by the educational background of the students. The results showed that there was no statistically significant difference ( $F_{(1,373)} = 0.05$ ;  $p = 0.824$ ) in the students' practice of self-medication across the educational categories (Table 7). The null hypothesis is hereby accepted.

**H<sub>0</sub>2:** There is no significant relationship between the predisposing factors and the practice

of self-medication among medical and non-medical students of Olabisi Onabanjo University.

To determine the relationship between the predisposing factors and practice of self-medication, an ANOVA test was conducted. The results revealed that the predisposing factors had significant relationship with the practice of the students on self-medication. ( $F_{(1,373)} = 2.047$ ;  $p = 0.006$ ) (Table 7). The null hypothesis is hence rejected.

**H<sub>0</sub>3:** There is no significant relationship between the enabling factors and the practice of self-medication among medical and non-medical students of Olabisi Onabanjo University.

An ANOVA test was conducted to determine the relationship between the enabling factors and practice of self-medication among the students.

The results indicated a significant relationship between the independent (Enabling factors) and dependent (practice) variables ( $F_{(1,373)} = 3.416$ ;  $p = 0.000$ ) (Table 7). The null hypothesis is hence rejected.

**H<sub>04</sub>:** There is no significant relationship between the reinforcing factors and the practice of self-medication among medical and non-medical students of Olabisi Onabanjo University.

To determine the relationship between the reinforcing factors and practice of self-medication, an ANOVA test was conducted. The results revealed that the reinforcing factors had significant relationship with the practice of the students on self-medication. ( $F_{(1,373)} = 2.609$ ;  $p = 0.000$ ) (Table 7). the null hypothesis is thereby rejected.

**Table 7.** Relationship between the Practice of Self-medication and the Predisposing Factors

Predictors	Mean Square	df	F	P-value
Practice vs Educational Category	0.012	373	0.050	0.824
Practice vs Predisposing factors	0.487	373	2.047	0.006*
Practice vs Enabling factors	0.780	373	3.416	0.000*
Practice vs Reinforcing factors	0.606	373	2.609	0.000*

## Discussion

Self-medication is a component of self-care recognized by World Health Organization (WHO). The practice of self-medication helps patients to take care of minor or common illnesses which can be a measure to reduce the pressure exerted on medical services. If the behaviors are practiced appropriately, self-medication can reduce cost and time spent in accessing health care. However, it is a malpractice with increased risk of adverse drug reactions, drug interactions, inadequate dosing, polypharmacy, course and indiscriminate drug use. This study examined the factors that may influence undergraduates' practice of self-medication in a Nigerian University. The respondents were selected and categorized into the medical and non-medical faculties. The findings revealed that majority of the students were within the age group 16 to 25 years and the mean $\pm$ SD age of the students was 20.06 $\pm$ 2.837 years. This finding is similar to findings from other studies. Majority of the respondents were Yoruba by tribe and Christian by religion. This is consistent with the predominant tribe and religion in this region of Nigeria and is similar to findings from a study by Babatunde, Fadare, Ojo, Durowade, Atoyebi, Ajayi, et al. (2016) in Ekiti State. The prevalence of self-medication in this study was 51.2%. This finding shows that the prevalence of self-medication is high among the selected group of people. The prevalence was similar to reported figures from previous studies around the globe (Babatunde, Fadare, Ojo, Durowade, Atoyebi,

Ajayi et al., 2016). This prevalence was however lower than the prevalence reported by Sarahroodi, Arzi, Sawalha & Ashtarinezhad, (2010).

The predisposing factors which may influence the practice of self-medication was measured by assessing the knowledge and attitudinal disposition of the students on self-medication. Majority of the students were aware that self-medication may cause adverse health problems especially drug resistance. In addition, they could rightly identify the components of self-medication. Among the drugs that are reported to be commonly used for the act of self-medication are antibiotics, pain relievers, malaria, and cough syrup amongst others; this findings is conforming to the findings of other studies which posited that the commonest groups of medication prone to self-medication include antibiotics, and pain-reliever (Albasheer, et al, 2016; and Afolabi, 2000). Also, majority reported that self-medication especially the antibiotics can cause drug resistance; this study is consistent with findings amongst undergraduate students in Zaria (Olayemi, Olayinka & Musa, 2010) and Kebbi (Ajibola, Omisakin, Eze, & Omoleke, 2018), it was reported that self-medication especially antibiotics could lead to resistance.

The medical students had a higher level of knowledge of self-medication compared to the non-medical students which reflected in the mean scores reported for both groups. The distribution of the categories of knowledge showed that majority of the non-medical students were in the lower category of knowledge compared to the medical students. The practice of self-medication



by the students was further aided by the impatience towards long waiting hours in the healthcare facilities. The existence of medical subjects in faculties' curricula may not have had an obvious effect on the attitude of students toward different aspects of self-medication. Both medical and non-medical students had negative attitudinal disposition towards self-medication. This may further explain the high prevalence among these study groups. Healthcare students should have a better knowledge and positive attitude towards the practice of self-medication. The predisposing factors had a statistically significant relationship with the practice of self-medication among the students.

The respondents highlighted that the medical services provided at the hospital is not worth the waiting time which is in line with the studies of Ocan, Bwanga, Bbosa, Bagenda, Waako, et al (2014) and Alshahrani, Alavudeen, Alakhali, Al-Wofari, Bahamdan, & Vigneshwaran (2019). The appropriate practicing of self-medication may reduce the burden on governments and healthcare systems by reducing the waiting time at the hospital for being treated by physicians and reduce the overall cost of health care services (Helal, Abou-Elwafa, 2017). Respondents also reported that they self-medicate because the medicine are always at their disposal at the pharmacy stores; this is expected given that a part of the respondents are medical students and they have access to prescriptions; this is also in line with the study of Goel, (2013); Sawalha, (2008). This calls for health authorities to make policies to create awareness among students about the consequences of self-medication. In addition, there should be strict regulation of sale of drugs other than over the counter drugs.

Hospital workers were also reported by majority of the respondents not to be friendly. Esan, Fasoro, Odesanya, Esan, Ojo, & Faeji, (2018), also reported similar finding. Various studies reported different reasons for engaging self-medication; these reasons however are subject to the environment and study populations where the studies were carried out. Lack of medical insurance also seem to be one of the reasons why respondents self-medicate; the results shows that the lack of medical insurance increases the chance of self-medication because people without medical insurance preferred to obtain drugs directly from pharmacies due to the high fees of medical appointments. This result

might indicate a need for public insurance for all people in the community. The finding is also similar to findings from Karimy, Rezaee-Momtaz, Tavousi, et al, (2019). The study also revealed that there is a significant relationship between the enabling factors and practice of self-medication among medical and non-medical students; this indicates that as long as the enabling factors to self-medication persist in the environment, the undergraduate will have more likelihood to practice self-medication.

Respondents who had medication at home are also more likely to use self-medication. This finding is consistent with that of the studies in South India (Divya, Bharatesh, Vasudeva, & Varalakshmi, 2016) and Egypt (Helal, & Abou-Elwafa, 2017). This is due to the fact that respondents who store medication mostly for the purpose of emergency in cases of illnesses in the future would have the possibility to use it and self-medicate. Majority of the respondents also self-medicate because they have friends who are medical students or they are medical students themselves; which is similar to the results of previous studies (Abay, Amelo, & 2010; Gutema et al, 2011; Girish, et al, 2013; and Patel et al, 2013). The reason being that the medical students have easy accessibility to the physicians and prescription procurement hence self-medication is practiced. The study also revealed that there is a significant relationship between the reinforcing factors and practice of self-medication among medical and non-medical students; this indicates that as reinforcing factors can significantly predict self-medication practices.

This study has found that the self-medication is common among both medical and non-medical students. Minor illnesses such as headaches and cough were the most common reasons for the practice of self-medication. Other than the treatment of minor illnesses, about two-thirds of the students in this study practiced self-medication because they knew or had taken in in the past. The practice may be enabled by the easy availability of drugs in the students' environment and the previous knowledge the students had about the drugs. This finding is similar to the findings from other studies (Badiger, Kundapur, Jain, Kumar, Patanashetty, Thakolkaran et al., 2012; James, Handu, Khalid, Khaja, Otoom & Sequeira, 2006). Analgesics, specifically, paracetamol, was reported as the most widely used group of drugs for self-medication in the

study. The similar to this finding, are results from previous studies by Mehta, & Sharma (2015), James. Hamdu, Khaja, Otoom, & Sequeira (2006) and Badiger, Kundapur, Jain, & Kumar (2012). Though the World Health Organization has recommended that doctor to patient ratio should be 1:1000, in Nigeria, it is 28 doctors to 100,000 patients (Fadare & Tamuno, 2011). This suggests that there are a lot of patients who have no access to doctors. This further implies that the few doctors will be stretched out and patients will lose desires in getting healthcare services from the facilities. As reported by the participants of this study, a small proportion had practiced self-medication because of long waiting hours in health facilities. In Nigeria, there is an uncontrolled access to almost all kinds of medicines. Another problem that is peculiar to Nigeria is the availability and uncontrolled access to all kinds of medicines especially prescription-only type. In respect to the individual educational categories, the practice of self-medication among the medical students was not different from the practice among the non-medical students.

Anti-microbial resistance is a major crisis all over the world, especially in developing countries where antibiotics are sold as over the counter (OTC) medications (Berendonk, Manai, Merlin, Fatta-Kassinos, Cytryn, Walsh, & Kreuzinger, 2015). To combat this global crisis, it is mandatory that the national governments show interest in this issue and formulate proper healthcare policies to combat the problem and regulate responsible self-medication. Result from this study demonstrated an upsurge in knowledge related to the over use of pain relievers causing liver problems; this conforms the study of Tariq, & Ud Din, (2017) also to the studies conducted in USA (Cham, Hall, Ernst, & Weiss, 2002; Chen, Schneider, & Wax, 2002; Hornsby, Przybylowicz, Andrus, & Starr, 2010; and Wood et al., 2010). It was also reported by majority of the respondents knew that pregnant women need to consult their physicians before taking any drugs which is in line with the findings of Navaro, Vezzosi, Santagatti, & Angelillo, (2018).

## Conclusion

The main finding of this study was that the prevalence of self-medication among undergraduates in Olabisi Onabanjo University was considerably high. Also, there was no difference in the practice of self-medication

among the medical and non-medical students. There is a need for a multifaceted approach to tackle the issues identified as predisposing factors to self-medication in Nigeria. First, is the need for efficient implementation of laws already in place to ensure that patent medicine stores do not sell prescription only medicines. Second, improving the waiting times and efficiency of health facilities in Nigeria in order to encourage more hospital visits by sick people. Third, at the community level there needs to be appropriate public health education to inform the public on the dangers of self-medicated antibiotics since family and friends are likely sources of drugs.

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