Original Research Article

Self-medication Knowledge, Perception and Practice Among Pharmacy Students in Eastern Nigeria.

Abstract

Background: The prevalence of self-medication is increasing, not only among the general public but also among college and university students in the health field. So, this study aims to assess the knowledge, perception and practice of self-medication among pharmacy students in the university of Nigeria, Nsukka.

Method: This was a university-based cross sectional study of 354 pharmacy students using a self-administered e-questionnaire. Data were summarized with descriptive statistics, chi square tests were used to assess association between the dependent and independent variables at a $p<0.05$.

Result: The prevalence of self-medication was 82% in this population. Among the respondents, 294(83.1%) demonstrated good knowledge of self-medication. Reasons for respondent's practice of self-medication include; easy access to online treatment guidelines (39.5%), knowledge of therapy for minor ailments (36.4%), and time considerations (45.2%). The commonest classes of drugs used for self-medication by our respondents were; Antimalarials (85.9%), Antibiotics (74.9%), Analgesics (76.0%) and Gastrointestinals (59.6%). No significant association was found between students' sociodemographic characteristics and the knowledge and practice of self-medication.

Conclusion: While the pharmacy students demonstrated a remarkable understanding of self-medication, they frequently engaged in this harmful practice, particularly using antibiotics, antimalarials, and analgesics. This study highlights the need for a greater emphasis on antimicrobial stewardship and the dangers of self-medication in the pharmacy curriculum.

Keywords: Self-medication, Knowledge, Practice, Pharmacy Students, Nigerian University.

INTRODUCTION

The topic of self-medication in health care is becoming more and more crucial. It empowers patients by fostering their independence in decision-making about the treatment of minor ailments. Self-medication is now a growing part of health care [1]. When a patient self-medicates, they do so without first seeking a doctor's advice or receiving a diagnosis. Afolabi [2] defined self-medication as the process by which a person actively participates in the treatment of minor illnesses using readily available pharmaceutical products. Self-medication with pharmaceuticals available without a prescription and over-the-counter medications is growing more common, particularly in developing nations [3]. Dnynesh*et al'*sglobal systematic analysis on the prevalence of self-medication found that antibiotics (82.59%) and NSAIDS (43.29%) were most commonly used self-medications, followed by cough and cold remedies (13.9%) [4]. The incidence of antimalarial self-medication ranged from 4.4% to 50%. The most often reported health issues were fever (45.32%), and cough and cold (61.43%). Family, friends, and pharmacists are the primary sources of self-medication since they not only supply the medications but also the knowledge about how to utilize them [5,6].

Since patients can manage minor illnesses without going to the hospital, rational self-medication lessens the strain on the health care system. Self-medication has been shown to provide other advantages, such as faster access to care, independence in managing symptoms, lower costs for health care, and fewer frequent trips to the doctor. Additionally, it benefits the community by reducing the need for sick days, relieving demand on medical services, and giving serious conditions more time [7]. Unchecked self-medication can result in the following negative effects: adverse drug reactions, disease masking, incorrect diagnosis, increased morbidity, drug interactions, antibiotic resistance, and resource waste [8,9-12]. The negative effects of self-medication can be felt to a large extent in low- and middle-income countries with scarce resources, low level of literacy, inadequate access to health care, as well as in the enormous population that lacks information or adequate knowledge about the therapy, dosage, duration of use or side effects [13-15].

Drug counterfeiters could easily infiltrate the legitimate supply chain in nations like Nigeria where drug regulations are hardly ever enforced and the drug distribution system is chaotic. This would lead to the proliferation of such adulterated products through sales in market places, patent medicine stores, motor parks, under bridges, and other locations where people who practice self-medication can easily purchase their medications due to their accessibility and affordability. Therefore, there's need for enlightenment and education on the dangers of self-medication in low-resource settings like Nigeria, with barely sufficient health insurance coverage and meagre portion of yearly budget allocated to the health sector. Majority of her populace pay out-of-pocket for their medications, and may seek cheaper alternatives via self-medication rather than going through the proper channel that may impose higher financial burden. Since university pharmacy students are that portion of the population who are highly informed and have access to all the information regarding their health, a study on the

self-practice of pharmaceuticals among this group is crucial. Additionally, research on the self-medication practice among pharmacy undergraduates is important because they will soon be working as drug prescribers and health educators [16].

The findings of previous studies suggest that influencing the prescribing conduct and knowledge of health care professionals can encourage responsible self-medication [17, 18, 19, 20]. Previous studies have, on a broader view, probed into the prevalence, knowledge, and perception of self-medication among health care students in a Nigerian University [21], but we intend to narrow this quest to future pharmacists that are the future caretakers of the nation's drug.

METHODS

Study setting and design

This study was a university-based cross sectional study carried out using a self-administered questionnaire. It was conducted among undergraduate pharmacy students at the University of Nigeria, Nsukka, Enugu state between August and October 2022.

Data Collection tool

The questionnaire used in this study for data collection was carefully designed after a thorough review of similar studies [22, 23, 24, 25] while utilizing the researcher's expertise and competency. The questionnaire comprised six sections with 38- questions. Section 1 gave a brief introduction about the research and the researchers, and affirmed the anonymity and confidentiality of respondents and their information, respectively. Section 2 sought the consent of the respondents before proceeding to the questions. Section 3 collected information on the sociodemographic characteristics of respondents, including their age, gender, level of education, religion, and whether or not their parents are health care employees. The respondent's knowledge of self-medication was evaluated in Section 4, which consisted of 10 questions with "Yes", "No", and "Don't Know" answers. Section 5 consisted of 15 Likert scale items (strongly disagree, disagree, neutral, agree, and strongly agree) to examine the respondent's perspective on self-medication. The self-medication practices of the respondents were explored in Section 6 with 8 yes-or-no questions. The overall score for the knowledge and perception questions was classified as "good" or "bad" based on the respondent's performance in each component. For the 10-item statements on knowledge with yes, no, and don't know responses, a total score of at least 8 (80%) out of the maximum possible score of 10 was considered "good" knowledge, whereas a knowledge score of 32 (80%) was considered "poor" knowledge. The binary categorization of knowledge scores was adapted from Bloom's cut-of criteria and other similar studies [25–27].

Inclusion and exclusion criteria

At the time this study was conducted, eligible participants were pharmacy students at the University of Nigeria, Nsukka, who were in the 300 level, 400 level, or 500 level of study. This is because the curriculum of pharmacy training in the majority of Nigerian universities is structured so that diseases and their treatment approaches are taught at the 300 level and above, while the 100 level and 200 level are intended to guide students through the prerequisite courses for pharmacy study and introduction to professional courses, respectively. As such, we

hypothesized that students in 300-level classes and higher, are likely to be more knowledgeable about common diseases and their treatments, making them suitable for our study.

Sample size determination

Giventhe 2120 registered students for the 2021/2022 academic session comprising students from 100level to 500level with a confidence level of 95%, the sample size was calculated using Yamane's formula as follows :$\boldsymbol{n = \frac{N}{1+N*(e)^2}}$

Where n= sample size

N= Population size = 2120

e= margin of error = 0.05

n=2120/1+2120(0.05)2 = 337 responses

An attrition rate of 5% was assumed = 0.95

Therefore attrition-adjusted sample size = 337/0.95 = 354 responses.

Pilot test and Content Validation

The data collection instrument was assessed by researchers with expertise in the subject area in order to ascertain the inclusiveness of questionnaire items that are in tune with the study objectives and to ensure face and content validity. Reliability of the instrument was ensured via a pretest on 20 students selected randomly from the three classes of interest and the obtained feed backs informed the modification of some questions to better suit the purpose of the study.

Sampling and data collection procedure

Judgmental sampling technique was used to select participants for this study and the questionnaire was shared electronically as a Google form. We reached out to our participants via their respective class Whatssap groups, gave them a brief overview of the study and obtained their informed consent before distributing the questionnaires to them individually. We asked them to send screen shots as a proof of response afterwards. Response anonymity and confidentiality was reiterated on the first section of the questionnaire and measures to curb multiple filling of questionnaire by a single participant were put in place.

Statistical analysis

The compiled data were coded, cleaned, and analyzed using IBM's statistical software for social research (science version 22). Descriptive statistics, such as frequencies and percentages were utilized used to summarize the data, while inferential statistics, such as chi square tests, were employed to assess the relationship between the variables. $P<0.05$ was used as the level of significance.

RESULTS

Demographic Characteristics of Respondents

(Table 1) below shows the demographic characteristics of our respondents. Out of the 370 questionnaires shared to respondents, 354 were filled, completed and included in the study producing a response rate of 95.6%. The dominant age group of the students was 21-25(68.9%) whereas those that were above the age of 30 consisted of just 3.4% of the sample. Within the aforementioned age groups, 174 (49.2%) were males, while the remaining 180 (50.8%) were females. In terms of their University level of study, 115 (32.5%) were in their 300 level, 90 (29.4%) were in their 400 level, and the remaining 149 (42.1%) were in their 500 level. A very large proportion 346(97.7%) of the students under study indicated that they were Christians with the remaining 2.3% identifying as Muslims . A total of 71 (20.1%) of respondents said their parents are (were) health care workers, while 283 (79.9%) said no.

Table 1: Demographic Characteristics of Respondents (n=354)

Variable		Frequency/Percentage	
Age (in years)	16-20	24	(6.8%)
	21-25	244	(68.9%)
	26-30	74	(20.9%)
	Greater than 30	12	(3.4%)
Religion	Christianity	346	(97.7%)
	Islam	8	(2.3%)
Level of study	300	115	(32.5%)
	400	90	(29.4%)
	500	149	(42.1%)
Gender	Male	174	(49.2%)
	Female	180	(50.8%)
Parents is(were) health care professionals?	Yes	71	(20.1%)
	No	283	(79.9%)

Knowledge Summary of Respondents

Out of the 354 respondents in this study, 294 (83.1%) were found to have decent understanding of what self-medication entails, whereas 60 (16.9%) were found to have inadequate knowledge, as shown in **(Figure 1)** below and in **(table 2)**

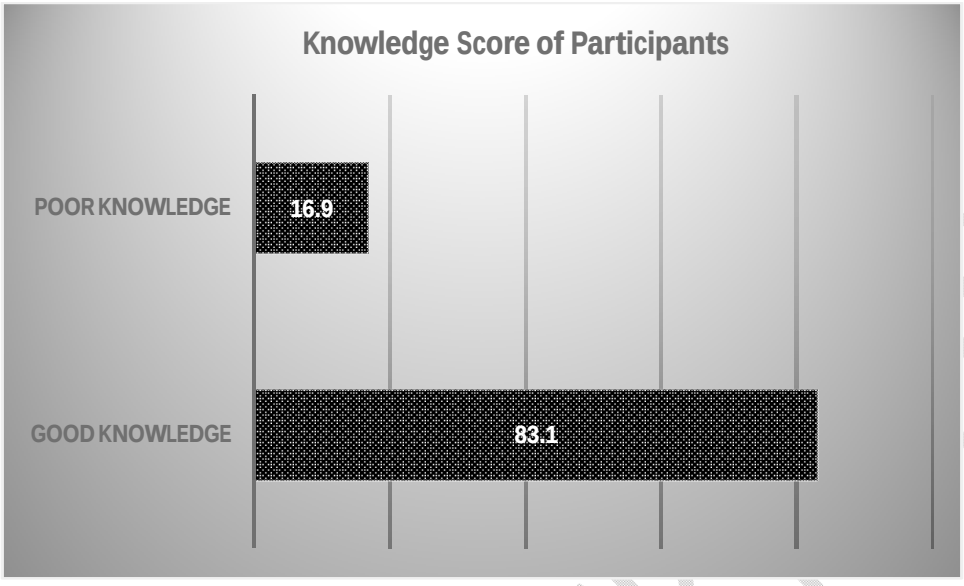

Figure 1: Knowledge Score of Participants (Summary) (n=354)

Table 2 Knowledge of Self-Medication (n=354)

Knowledge questions	**Frequency (%)**		
	YES	NO	DON'T KNOW
Self-medication is defined as "the taking of drugs, herbs or home remedies on one's own initiative, or on the advice of another person, without consulting a doctor or pharmacist."	350 (98.8%)	3 (0.8%)	1 (0.3%)
Taking alcohol to relieve depression related to academics or family pressure is self-medication	272 (76.8%)	61 (17.2%)	21 (5.9%)
Using an old prescription to treat a recurring condition is self-medication	331 (93.5%)	14 (4.0%)	9 (2.5%)
Using left-over medications from a prior properly diagnosed illness to treat a recurrent one is self-medication	317 (89.5%)	27 (7.6%)	10 (2.8%)
A physician's prescription is necessary before	272	80	2

the purchase of any medication	(76.8%)	(22.6%)	(0.6%)
It is possible to correctly treat illnesses without the physician's prescription	243 (68.6%)	92 (26.0%)	19 (5.4%)
Using prescription only medications without the doctor's prescription can cause complications	329 (92.9%)	13 (3.7%)	12 (3.4%)
Self-medication can lead to drug dependence and adverse drug reaction	349 (98.6%)	2 (0.6%)	3 (0.8%)
Self-medication can cause pathogen resistance	343 (96.9%)	4 (1.1%)	7 (2.0%)
Responsible self-medication help to reduce the cost of treatment, travelling time as well as doctor's time i.e, consultation time	259 (73.2%)	73 (22.3%)	16 (4.5%)

Overall Prevalence of Self-Medication

As shown in **(Figure 2)**, a total of 290 (81.9%) of the 354 participants in this study claimed to having self-medicated in the past, whereas 60 (18.1%) denied ever being involved in the practice of self-medicate.

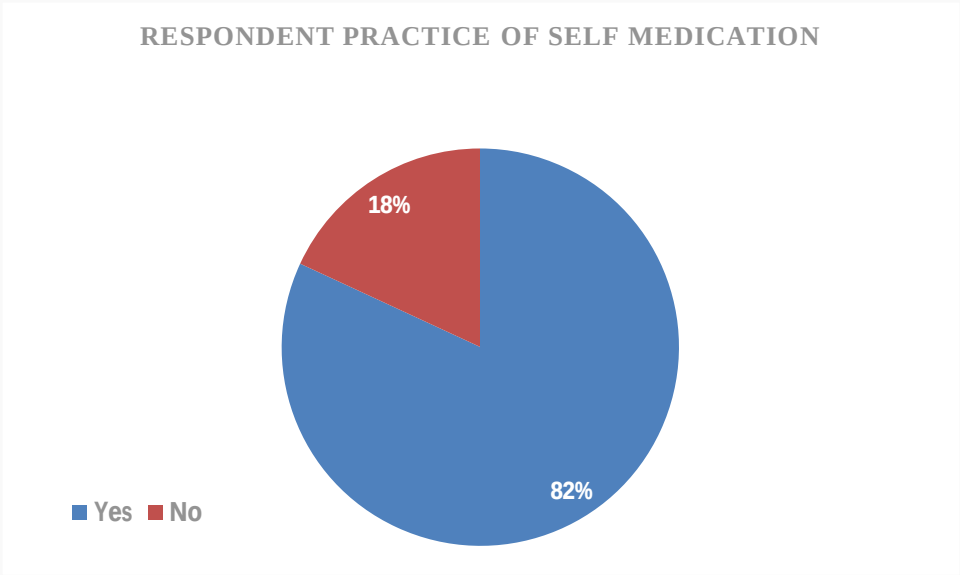

Figure 2: Overall Prevalence of Self-Medication

Determinants of Good or Poor Knowledge of Self-Medication

As clearly shown in **Table 3,** all the study participants irrespective of their age demonstrated an appreciable knowledge of self-medication, having scored more than 80% on average (p=0.857). A striking observation was made with respect to the relationship between the students' religion and their understanding of self-medication. Those that practiced Christianity had a better understanding (score, 84.1%) compared to those that practiced Islam (score, 37.5%), and a significant association was also found (p=0.001*). The level of study of the study participants had no significant influence (p=0.195) on their understanding of self-medication as they all demonstrated a fair knowledge of what it was. Gender also, didn't play any remarkable role on the participants' knowledge of the subject matter as both genders scored high (male 80.5%, female 85.6%). Those students who admitted to having parents that are health care workers didn't display any notable difference regarding their knowledge of self-medication having scored about 83% on average with no statistically significant association (p=0.283).

Table 3: Determinants of Knowledge of Self-Medication (n=354)

DEMOGRAPHICS	**Good Knowledge**	**Poor Knowledge**	**p-Value**
Age			
16-20	21 (87.5%)	3 (12.5%)	0.857
21-25	200 (82.0%)	44 (18.0%)	
26-30	63 (85.1%)	11 (14.9%)	
Greater than 30	10 (83.3%)	2 (16.7%)	
Religion			
Christianity	291 (84.1%)	55 (15.9%)	**0.001***
Islam	3(37.5%)	5 (62.5%)	
Level of Study			
300 Level	95 (82.6%)	20 (17.4%)	0.195
400 Level	80 (88.9%)	10 (11.1%)	
500 Level	119 (79.9%)	30 (20.1%)	
Gender			
Male	140 (80.5%)	34 (19.5%)	0.201
Female	154 (85.6%)	26 (14.4%)	

Parents is (Were) Health Care Professionals?			
Yes	62 (87.3%)	9 (12.7%)	0.283
No	232 (82.0%)	51 18.0%)	

Respondent's Perception of Self-Medication

About 192(54.2%) of the study participants understood the meaning of self-medication. Also, 135 (38.1%) of respondents self-medicated for minor ailments due to unfriendly attitude of health care workers, while 140 (39.5%) of respondents disagreed with the notion that they self-medicated because they could easily find treatment guidelines on Google and, as a result, wouldn't waste time seeing a doctor. A sizeable proportion of the students 136 (36.4%) relied upon their good command of pharmacology for the treatment of self-recognised symptoms rather than seeing a physician, while 133 (37.6%) self-medicated frequently due to the practice of poly pharmacy by some physicians to ease the pill and financial burden. A sizeable proportion of respondents 137(38.7%), believed that self-medication drugs were less expensive than those prescribed by a physician. About 115 (32.5%) preferred visiting a qualified physician to a chemist. Only 148 (41.8%) respondents admitted that self-medication is hazardous, with 113 (31.9%) and 150 (45.2%) of the students claiming that self-medication provides immediate symptom alleviation and saves time, respectively. As shown in **(Table 4)**, a total of 119 (33.6%) and 135 (38.1%) of the respondents refuted the notion that using caffeinated beverages for energy during exam preparation, and tramadol for pain relief when engaging in physically demanding duties are not self-medication.

Table 4: Respondent's Perception of Self-Medication (n=354)

Perception Question	**Frequency (%)**				
	SD	D	N	A	SA
Self-medication is the use of drugs without physician's prescription or orientation of a physician	25 (7.1%)	2 (0.6%)	4 (1.1%)	131 (37%)	192 (54.2%)
I often self medicate when I'm having minor symptoms because I can't stand the unfriendly attitude of health workers	31 (8.8%)	97 (27.4%)	54 (15.3%)	135 (38.1%)	37 (10.5%)
I can easily find treatment guidelines for my symptoms on goggle, so there's no need wasting my time to see a Doctor	93 (26.3%)	140 (39.5%)	60 (16.9%)	54 (15.3%)	7 (2.0%)
As a pharmacy student with a certain knowledge of pharmacology, I don't need to run to the Doctors all the time to treat	24 (6.8%)	70 (20.1%)	63 (17.8%)	136 (36.4%)	60 (16.9%)

myself.					
I self medicate sometimes because I realized that some Doctors prescribe drugs that are not necessary thereby adding to my financial and pill burden	25 (7.1%)	85 (24%)	74 (20.9%)	133 (37.6%)	37 (10.5%)
Self-medication drugs are cheaper than prescription medicines	28 (7.9%)	84 (23.7%)	76 (21.5%)	137 (38.7%)	29 (8.2%)
I feel more comfortable going to chemist to buy medicines than consulting a doctor	79 (22.3%)	115 (32.5%)	63 (17.8%)	86 (24.3%)	11 (3.1%)
Self-medication is not harmful	112 (31.6%)	148 (41.8%)	73 (20.6%)	19 (5.4%)	2 (0.6%)
Medicines obtained from sellers without prescription are just as effective as those prescribed by a physician	57 (16.1%)	126 (35.6%)	78 (22.0%)	83 (34.4%)	10 (2.8%)
Self-medication provides quick relief of symptoms	46 (13.0%)	77 (21.8%)	112 (31.6%)	113 (31.9%)	6 (1.7%)
Consulting physician when ailment is minor is not necessary	51 (14.4%)	133 (37.6%)	80 (22.6%)	81 (22.9%)	9 (2.5%)
Self-medication drugs saves time	48 (13.7%)	50 (14.0%)	74 (20.9%)	150 (45.2%)	22 (6.2%)
Self-medication removes the stress to queue up to see a physician	23 (6.5%)	27 (7.6%)	54 (15.3%)	212 (59.9%)	38 (10.7%)
Taking caffeinated and energy drinks during exam period is not self medication since it's for strength and mental alertness	15 (16.7%)	119 (33.6%)	69 (19.5%)	92 (26.0%)	15 (4.2%)
Taking tramadol when engaged in physically demanding tasks to ease body pain is not self medication	156 (44.1%)	135 (38.1%)	24 (6.8%)	33 (9.3%)	6 (1.7%)
SD=strongly disagree, D=disagree, N=neutral, A=agree, SA=strongly agree.					

Respondent's Practice of Self-Medication

The respondents' pattern of self-medication practices was probed so as to gain insight in to the rationality or irrationality of such medication use. There was a small difference in the proportion of respondents who visited a health care facility when they took ill and those who did not (50.6% versus 49.9%). Different proportions of the students admitted to using the following classes of medications independently in the past; Antimalarials (84.9%), antibiotics (74.9%), analgesics (76%), gastrointestinal (59.6%), antiprotozoal (46.0%), and anti-ulcer medications (41.0%). Regarding how they learnt about the drugs they self-medicated with, respondents identified past experience (90.4%), medical professionals (36.7%), information on the leaflet (70.1%), and advertising (49.1%). More than two-third of the study participants got their drugs from community pharmacies (94.9%) and patent medicine stores (94.9%). Malaria (95.5%), cough (86.2%) and body pain (83.1%) were the major symptoms/illness that prompted the respondents to self-medicate. Most participants indicated knowledge of the indication, dosage and proper use of the drugs as shown in **(Table 5)**.

Table 5: Practice Of Self Medication (n=354)

PRACTICE QUESTIONS	**FREQUENCY (PERCENTAGE)**	
Do you have a regular health facility or medical personnel you visit? How often do you visit the health facility or physician?	YES	NO
Every time I fall ill	179 (50.6%)	174 (49.4%)
Once a year	85 (24%)	269 (76%)
Once every six months	70 (19.8%)	284 (80.2%)
Never	50 (16.4%)	296 (83.6%)
Have you ever used any drug without doctor's prescription?Indicate the classes of drugs you have used without doctor's prescription	YES	NO
Anti malarial	304 (85.9%)	50 (14.1%)
Antibiotics	265 (74.9%)	89 (25.1%)
Gastrointestinal	211 (59.6%)	143 (40.4%)
Analgesics	269 (76%)	85 (24%)
Anti ulcer	145 (41%)	209 (59%)
Anti protozoal	163 (46.0%)	191 (54.0%)
Never	64 (18.1%)	290 (81.9%)

How do you come about these drugs?	YES	NO
Past experience	320 (90.4%)	34 (9.6%)
Medical personnel	130 (36.7%)	224 (63.3%)
Information on the leaflet	248 (70.1%)	106 (29.9%)
Advertisements	175 (49.4%)	179 (50.6%)
Where do you obtain these drugs from?	YES	NO
Chemist's store	222 (62.7%)	132 (37.3%)
Market	87 (24.6%)	267 (75.4%)
Pharmacy	336 (94.9%)	18 (5.1%)
Hawkers	17 (4.8%)	337 (95.2%)
What ailment do you usually obtain drugs for?	YES	NO
Typhoid	251 (70.9%)	103 (21.9%)
Body pain	291 (83.1%)	60 (16.9%)
Cough	305 (86.2%)	49 (13.8%)
Malaria	338 (95.5%)	16 (4.5%)
Ulcer	149 (42.1%)	205 (57.9%)
Stomach ache	236 (66.7%)	118 (33.3%)
Infection	117 (50.0%)	117 (50.0%)
How do you request for the medication you want?		
Mentioning the name	324 (91.5%)	30 (8.5%)
Telling the symptoms	263 (74.3%)	91 (25.7%)
Drug group	157 (44.4%)	197 (55.6%)
What do you know about the drug you take without prescription?		
Name	343 (96.9%)	11 (3.1%)
Indication for use	334 (94.4%)	20 (5.6%)

Dose	306 (86.4%)	48 (13.6%)
How to use it	322 (91.0%)	32 (9.0%)

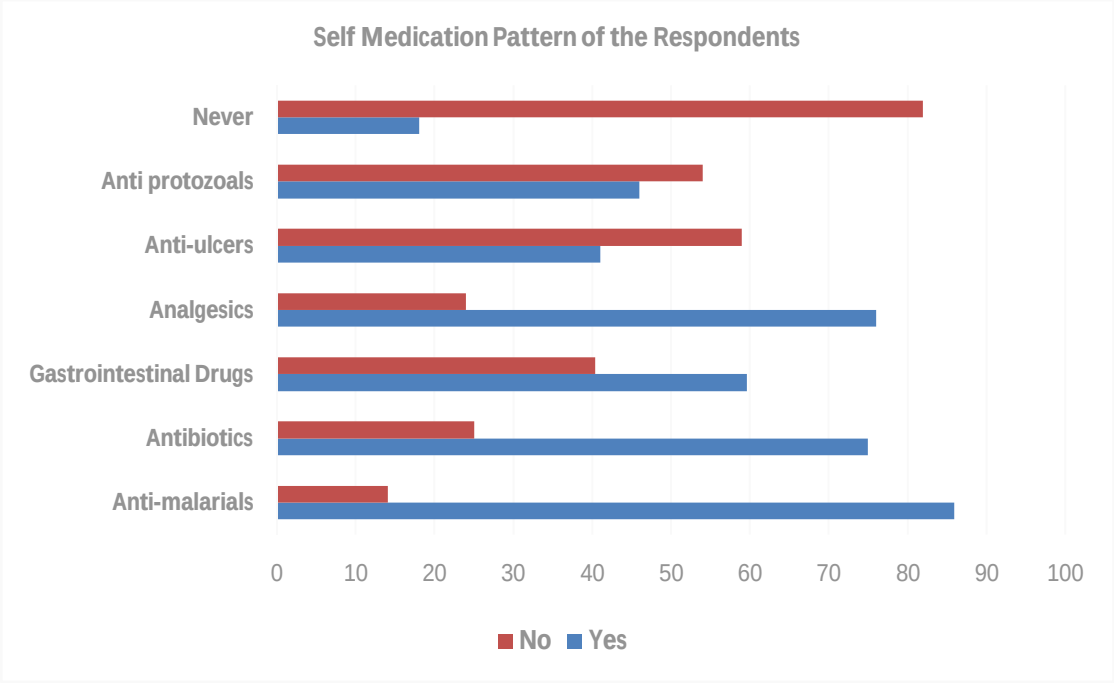

Figure 3: Self Medication Pattern of the Respondents

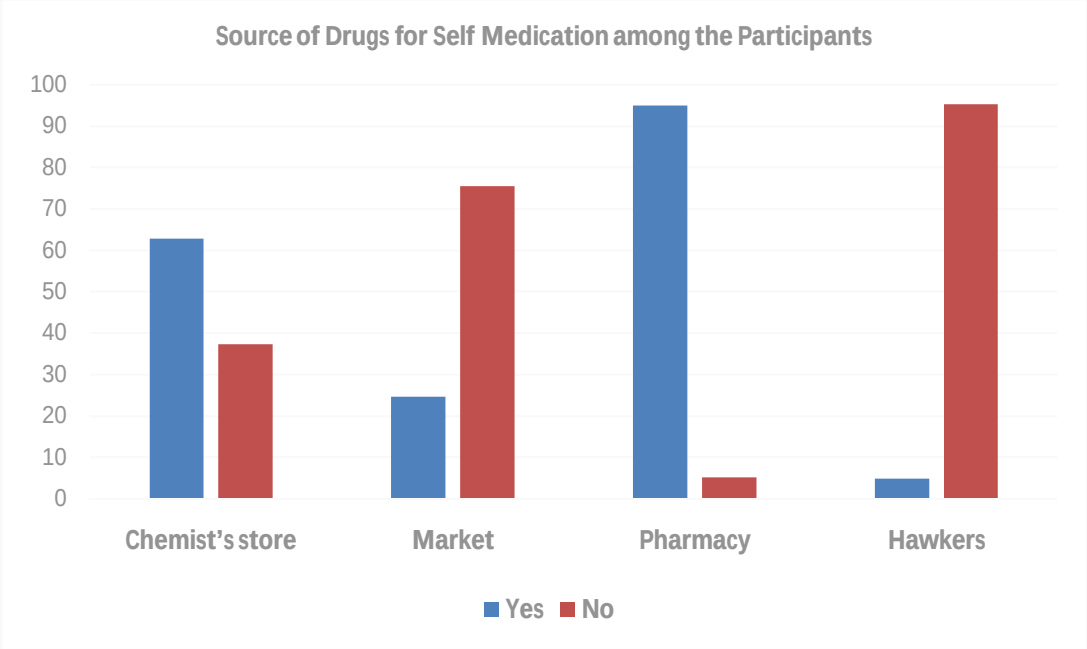

Figure 4: Source of Drugs for Self-Medication among the Participants

DISCUSSION

This study probed in to the knowledge, perception and practice of self-medication among undergraduate pharmacy students at the University of Nigeria, Nsukka. To the best of our knowledge, this study is the first of its kind carried out in southeastern part of Nigeria. This study, was inspired by the rising prevalence of self-medication practices among undergraduate pharmacy students in both developed and developing nations as evidenced in some studies carried out. As future drug experts, they serve as a checkpoint between the prescriber and the patient when it comes to medicine use, therefore evaluating their knowledge as well as how they perceive self-medication is essential. The prevalence rate of self-medication among our participants was found to be 81.9%. This finding is in congruence with that observed in similar studies carried our in Serbia, Ethiopia and Malaysia where the prevalence rate was found to be 81.3% [28], 72.8% [29] and 80% [30] respectively. A recent large multinational study carried out in four European countries revealed thus: 69.6% in Czech Republic, 71.5% in Italy, 85.9% in Romania and 93.9% in Spain. [31] It is noteworthy that respondents between the ages of 21 and 25 engaged in self-medication at the highest rate (83.6%), as compared to other age groups. This could be easily explained by the fact that respondents within these age groups make up the majority of our target population, as this is the predominant age range found among college students. In terms of gender, we discovered that women were more likely to self-medicate than men (80.3% versus 79.9%), and this agrees with the findings of Wuroala A. *et al.*'s [42] where the prevalence of self-medication among women and men was 58.4% and 50.6%, respectively. Also, a study carried out by Elkalmi*et al.*, [32] reported a higher prevalence [77.2%] of self-medication among females compared to the male gender, and the same trend was observed in similar studies [33,34,35]. A possible explanation for this observed trend could be that women self-medicate with analgesics and anti-infectives to alleviate menstrual pain and treat vaginal

infections, as the anatomy of the female genital makes it more susceptible to bacterial and fungal infections. However, there was no statistical correlation between respondents' gender and self-medication behavior.

This study revealed that the pharmacy students in the University of Nigeria Nsukka had a good knowledge score of 83.1% which is quite high and this agrees with other studies [36,37], which reported that majority of the students had a fairly good knowledge of self-medication. The above findings from this study disagrees with that of Elkalmi*et al.*, [32] that revealed a poor knowledge of self-medication among undergraduate pharmacy students in Malaysia. With respect to perception, majority of our respondents (192;54.2%) had a positive perception of what self medication entails. A good number (135;38.1%) resorted to self-medication most of the time so as to avoid the unfriendly attitude of health care workers. There's no gainsaying this fact because some health care workers interact with patients in a manner that erode their confidence and willingness to approach them for any health need. A good first impression with the patient would encourage him or her to confide in a qualified health care profession in the event of any health challenge especially the ones they feel too insecure to talk about. This study revealed that online sources such as Google encouraged some (54;15.3%) of our respondents to circumvent consultation with a physician since they could easily search for treatment approaches for their symptoms online. Sourcing for treatment information online could be helpful most times but there are information especially the randomly published ones by bloggers and amateur content writers that could be misleading and should be subject to further verification by looking up evidence-based studies on that particular treatment approach such as journal articles. Most of our respondents resorted to self-medication for the following reasons: it saves time (150;45.2%), provides quick relief symptoms (113;31.9%), removes stress of queuing up to see a doctor (212;59.9). The study by Elkalmi*et al.*, [32] also found out that time saving was one of the major reasons that prompted pharmacy students to indulge in self-medication, as also observed by kayalvizhi and Senapathi [38]. The above outlined reasons to some extents are justifiable because of the apparent bottlenecks and hassles patients pass through to see a doctor in developing countries using Nigeria as typical case. Hence, quick and easy access to health care experts such as doctors and pharmacists would go a long way to encourage consultation with a health care professional for health needs and necessary counselling.

Regarding the symptoms/illnesses that prompted our participants to self-medicate, it was observed that cough 305(86.2%), malaria 338(95.5%), body pain 291(83.1%) and typhoid fever 251(70.9%) topped the list. This finding is in harmony with that of Beyene A *et al.*, [39] where majority of the pharmacy students used medications on their own to treat cold and flu (79.2%), and for relieving pain (75.3%) which also agrees with the study [40]. AlsoBannergee and Bhadury [34] reported that cough and common cold were the symptoms that prompted students to self-medicate. While in Palestine, headache, sorethroat, flu and dysmenoorhea were the most common indications warranting self-medication [34].

With respect to the class of medications our respondents used for self-medication, it was observed that anti malaria came first in rank (85.9%) then followed by analgesics (76.0%) and antibiotics (74.9%). This result agrees with the findings of Mgbahurike and Nenwi [42] where the class of medications used for self-medication freqently by pharmacy students at the University of Porthacourt appeared as follows; anti malaria (69.7%), analgesics (91.6%), antibiotics (84.7%) and these observations were consistent with the studies [36,37]. Also, a

similar study carried out in Belgrade, Serbia reported that analgesics, vitamin supplements and antipyretics were among the most frequently prescribed medications [17]. Due to lax regulation and a leaky surveillance system especially in developing countries like Nigeria, the indiscriminate use of antibiotics has continued to fester and grow, posing a significant threat to public health due to the rising resistance of microbes to these drugs. This study, along with others, demonstrates the high rate of self-medication with antibiotics among pharmacy students. This is a major worry, as it is assumed that these students will educate the public about the dangers of antibiotic resistance. This observation necessitates a reevaluation of the curriculum of pharmacy training at Nigeria's higher institutions so as to properly instruct these future stewards in antimicrobial stewardship and its public health significance.

Also, worthy of note is the source from which our respondents received their medicines. Interestingly, the majority of our respondents (324;91.5%) bought their medications from community pharmacies, whereas a decent proportion 222 (66.7%) obtained their medications from patent medicine stores and only a handful (17; 4.8%) obtained their medications from street vendors. The above findings is in congruence with that of Tomas P,A*et al.*, [41] where 92% of the students purchased the needed medicine from community pharmacies. The fact that the respondents recognize the significance of receiving medications from a trusted source is a tremendous relief. Another noteworthy result is that the majority of respondents possessed a great deal of information on the drugs they self-medicate with. This may indicate that they may have acquired a thorough understanding of drugs and are self-medicating based on this knowledge.

CONCLUSION AND RECOMMENDATIONS

The pharmacy students at the University of Nigeria Nsukka have a decent understanding of self-medication and a relatively positive attitude toward it, but they engage in self-medication frequently, particularly with antibiotics, antimalarial, and analgesics. Their knowledge and participation in self-medication are significantly independent of their sociodemographic characteristics. Hence, this underscores the need for more sensitization on the dangers of self-medication and the need to revisit the curriculum for further emphasis on rational drug use and antimicrobial stewardship.

EHICAL ISSUE

Detailed explanation about the study was given to the respondents before obtaining their informed consent to participate. They were assured of their liberty to withdraw from the study at any point without any consequences. Confidentiality, privacy and anonymity were upheld in accordance with Nuremberg code and Helsinki Declarations. The research was reviewed and endorsed by the Research and Ethics committee of University of Nigeria Teaching Hospital Ituku-ozalla (NHREC/04/08/2022B-FWA00002458-IRB00002323).

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