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Original Article

The Practice and Factors Modulating Self-Medication among University Healthcare Students in Ilorin, North-Central Nigeria

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ABSTRACT

Background: 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. Although it can be beneficial if practiced appropriately, there are many risks associated with it, including misuse, abuse, addiction, and rising antibiotic resistance. This study evaluated the prevalence of self-medication practices and the factors associated with it.

Methods: A descriptive cross-sectional survey was conducted using systematic random sampling among students of health-related courses at the University of Ilorin, Ilorin, Kwara State, between 1st May and 31st August 2024, with a pretested, self-administered questionnaire. Data were analyzed using SPSS version 23. Descriptive statistics (frequency tables and cross-tabulations) summarized the data, while chi-square test was used to test associations between variables at a significance level of $p < 0.05$.

Results: A total of 269 students participated, with the majority, 173 (64.3%), being medical students. All respondents practiced self-medication, with nearly half (49.1%) doing so rarely, one-third (33.1%) sometimes, and a smaller proportion (10.0%) often. The main reasons for self-medication were perception of symptoms as mild (82.5%), previous experience with the drug (82.5%), urgency of the health problem (74.7%), convenience of access to medicines (71.4%), and reliance on academic knowledge (66.2%). The most used drugs were antimalarials (85.9%), analgesics (82.5%), cold/cough remedies (77.7%), and antibiotics (72.9%). Younger students, undergraduates, those in lower levels, and those perceiving their health as good/very good were more likely to self-medicate ($p = 0.020, 0.017, 0.008, 0.002$).

Conclusions: This study concluded that self-medication is a persistent problem, commonly practiced among university healthcare students, involving the use of various drug classes. Efforts should focus on strengthening and enforcing prescription policies and enlightening students on rational drug use and the dangers of self-medication.

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Introduction

The World Health Organization (WHO) defined Self-medication as "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." (WHO, 2000; Esan, 2018). It may involve the use of over-the-counter medications, prescription-only medicines, or the use of complementary and alternative medicines (Zeid *et al*., 2020; Torres *et al*., 2019).

Self-medication (SM) is a form of self-care and it plays an important role in managing minor illnesses and can be beneficial if practiced properly. However, there are several risks associated with it if its use is left unrestricted among the public (Ray *et al*., 2022; Oyediran *et al*., 2019). Globally, SM is common, especially among students of medicine and allied health courses (Azócar *et al*., 2023; Lukman *et al*., 2020). As aspiring practitioners, the students' habits are shaped by their medical education and easy access to drugs (Akande-Sholabi *et al*., 2021). While their training provides knowledge about drug use, it also increases the possibility of misdiagnosis and incorrect self-treatment. Although SM may provide quick relief for mild illnesses and minor conditions, it is also associated with serious risks of overuse, dependence, adverse drug interactions, and complications. The rising antimicrobial resistance globally, which is a cause of concern, has also been attributed to unregulated antibiotic use. Studies show that healthcare students often practice SM because it is often affordable, convenient and time-saving (Banerjee *et al*., 2019; Loni *et al*., 2023; Alshammari *et al*., 2021), while they also rely heavily on knowledge from coursework and clinical experience (Osemene *et al*., 2020). The practice of SM among healthcare students has been widely reported; however, most studies emphasize prevalence, while little attention is given to the underlying reasons causing it and professional implications in the future, as the dangers, including drug misuse, abuse, addiction, and rising antibiotic resistance, make SM a serious public health concern.

This study investigated SM among University of Ilorin healthcare students and the factors that influence it, in order to provide practical solutions. The findings will help to design strategies and interventions to control SM, and also help in safeguarding both the health of these future professionals and the quality of care they provide.

Materials and Methods

Study design, setting and Population

This study was a cross-sectional study conducted using a validated interviewer-administered questionnaire among both undergraduate and post-graduate students in healthcare-related departments of the College of Health Sciences (Medicine & Surgery, Medical & Laboratory Science, Nursing and Physiotherapy), University of Ilorin, Ilorin, Kwara State, North Central Nigeria, between 1st May 2024 and 31st August 2024.

Sample Size Determination

The minimum sample size was calculated using the formula (Bolarinwa, 2020):

$$N = \frac{z^2pq}{d^2}$$

Where:

N = Minimum sample size

z = Standard normal deviation, usually set at 1.96

p = 0.19 (19%) satisfaction level in a similar survey among the students' population (Kokabisaghi *et al*., 2024).

q = 1-p

d = Degree of accuracy, usually set at 0.05

$$\frac{1.96^2 \text{ X } 0.19 \text{ X } 0.81}{0.05^2} = 236$$

A minimum sample size of 236 was calculated.

However, to compensate for non-response, assuming a non-response rate of 10%, an adjustment was made by adding 15% to the sample size calculated, thus giving a sample size of 278 respondents.

Compensation for non-response: 236/0.85 = **278.** This was rounded up to **280.**

Sampling Technique and selection

Respondents were selected using systematic random sampling. The study was conducted between May and August 2024.

Eligibility Criteria

Eligible participants were all registered undergraduate and post-graduate students of the College of Health Sciences, University of Ilorin for the 2023/2024 academic session. Students who were present in class at the time of data collection, willing to participate and gave informed consent to take part in the study were included. Those who were absent from the class during the period of questionnaire administration or who declined consent were excluded from the study.

Data collection instrument

The questionnaire used for this study was developed by the researchers after a thorough review of related studies (Guo *et al*., 2024; Agbesanwa *et al*., 2024; Abdi *et al*., 2018; Alkhatatbeh *et al*., 2016) and by drawing on the team of researchers' expertise. Data were collected using a Self-administered, anonymous, structured, closed-ended questionnaire in English, administered to participants who met the inclusion criteria. To ensure clarity, applicability, and acceptability, the questionnaire was pretested among

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healthcare students in the College of Health Sciences, Kwara State University, Malete. Feedback from the pretest informed minor adjustments before the main study.

The questionnaire comprised three sections. Section A evaluated socio-demographic characteristics of the students such as age, gender, educational status, level of study and course of study. Section B consisted of questions on the common symptoms that necessitated self-medication. Section C consisted of questions on practice, factors influencing self-medication, and drugs commonly used.

Sampling and data collection procedure

Respondents were selected using systematic random sampling with proportional allocation to class attendance. On each data collection day, students attending pre-identified major lectures in each department and level formed the sampling frame. After the lecture, the purpose and objectives of the study were explained. The students were counted and the required sample per class was determined proportionally. A sampling interval was calculated, the first respondent selected using a lottery, and then every n^{th} student approached for each of the classes, based on the calculations. Non-responders were replaced by the next student in sequence. The students were informed that the questionnaire would take only a few minutes to complete and encouraged to fill it out immediately and submit it there and then, rather than taking it away for later submission, though a few still left with the questionnaire without submitting. A total of 269 questionnaires were retrieved out of 280 distributed, giving a response rate of 96.1%. The high response rate was achieved because data collection took place immediately after lectures in a controlled classroom environment.

Data Analysis

Data analysis was done using IBM Statistical Package for Social Sciences (SPSS version 23), and frequency tables and cross-tabulations were generated. Chi-square and Fisher's Exact tests were used to determine the statistical significance of observed differences in the categorical variables. Association between socio-demographic variables and respondents' engagement in SM practice was evaluated with the Chi-square. A confidence limit of 95% was used and p-value of less than 0.05 was considered significant.

Ethical Consideration

The study received ethical approval from the Ethics and Research Committee of the University of Ilorin Teaching Hospital, Ilorin, Kwara State. Participation was entirely voluntary, and the study maintained strict protocols to ensure both confidentiality and anonymity for all participants.

Results

Most respondents were female (57.6%), aged 21–24 years (52.8%), with a mean age of 24.3 years. The majority were single (90.0%) and undergraduates (92.9%). Students from the Medicine and Surgery department constituted the largest group (64.3%) of respondents. Most respondents rated their health as very good or excellent (74.0%). [Table 1].

Table 1: Sociodemographic characteristics of the study participants

Variables	Frequency (N=269)	Percent (%)
Gender		
Male	114	42.4
Female	155	57.6
Age group (years)		
17-20	50	18.6
21-24	142	52.8
25-28	46	17.1
29-32	13	4.8
≥ 33	18	6.7
Mean age	**24.3±6.7**	
Marital status		
Single	242	90.0
Married	26	9.7
Widow	1	0.4
Educational status		
Postgraduate	19	7.1
Undergraduate	250	92.9
Department		
Medicine & surgery	173	64.3
Medical & Laboratory Science	19	7.1
Nursing	61	22.7
Physiotherapy	16	5.9
Level		

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200	42	15.6
300	39	14.5
400	95	35.3
500	49	18.2
600	28	10.4
Postgraduate	16	5.9
Health Status		
Excellent	95	35.3
Very good	104	38.7
Good	64	23.8
Fair	6	2.2

The most commonly reported symptoms were headache (82.9%), malaria symptoms (78.8%), cold & cough/sore throat (72.9%), fever (62.8%), diarrhoea (56.5%), and abdominal pain (52.8%) of the respondents. [Table 2].

Table 2: Common symptoms necessitating Self-medication among study participants

Common symptoms*	Frequency (N=269)	Percentage (%)
Headache	223	82.9
Toothache	81	30.1
Earache	55	20.4
Malaria symptoms	212	78.8
Skin infection	105	39.0
Chest pain	61	22.7
Fever	169	62.8
Cold & cough/ Sore throat	196	72.9
Diarrhoea	152	56.5
Abdominal pain	142	52.8
Inability to sleep	76	28.3
Body weakness	124	45.1
Nausea or/and Vomiting	90	33.5
Constipation	113	42.0
Others: *(Menstrual pain, Breast discharge, Vaginal discharge, Painful urination)*	39	14.5

* Multiple responses

The two leading reported reasons for SM among the respondents were that they felt the symptoms were mild (82.5%), while the same proportion also stated dependence on previous experience with the same medicines. Other commonly cited factors comprised urgency of the health problem (74.7%), convenience of access to medicines (71.4%), and reliance on academic knowledge (66.2%). Cost of consultation (62.8%), long clinic waiting times (61.3%), and reuse of old prescriptions (60.6%). Less frequently reported reasons which played a role in their decision to SM were: advice from others (56.1%), transport challenges (51.3%), avoidance of being a patient (41.6%), information from the Internet (36.8%), hospital phobia (27.5%), drug advertisements (18.6%), and lack of trust in the healthcare provider (10.0%) [Table 3].

Table 3: Reasons for Self-medication among study participants

Reasons*	Frequency (N=269)	Percentage (%)
Urgency of the problem	201	74.7
High cost of consultation	169	62.8
Transport challenges / Long distance to clinic	138	51.3
Convenience of Access to medicines	192	71.4
Reliance on academic knowledge	178	66.2
Symptoms considered mild	222	82.5
Advice from others	151	56.1
Previous experience with medicine	222	82.5
Old prescriptions	163	60.6
Long Clinic waiting time	165	61.3
Information from the Internet	99	36.8
Drug Advert	50	18.6
Avoidance of being a patient	112	41.6
Lack of trust in the healthcare provider	27	10.0
Hospital phobia	74	27.5

* Multiple responses

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The most commonly used drugs for SM were anti-malarial (85.9%), analgesics (82.5%), and cold and cough medicines (77.7%). Antibiotics were also widely reported (72.9%), alongside vitamins and dietary supplements (66.9%). More than half of respondents reported using anti-diarrhoeal agents (55.8%) and antacids or anti-ulcer medications (54.6%). It is also worth noting that herbal medicines accounted for 40.1%) [Table 4].

Table 4: Commonly used medicines for Self-medication among study participants

Drugs*	Frequency (N=269)	Percentage (%)
Analgesics	222	82.5
Anti-malaria	231	85.9
Antibiotics	196	72.9
Anti-hypertensives	32	11.9
Antacids/Anti-ulcer medication	147	54.6
Anti-diarrhoea	150	55.8
Antihistamine	118	43.9
Cold and cough medicine	209	77.7
Vitamins and dietary supplements	180	66.9
Contraceptives	71	26.4
Herbal medications	108	40.1
Anti-diabetics	16	5.9
Anti-asthmatics	24	8.9
Anti-depressants	26	9.7
Drugs for treatment of hair and skin disorders	107	39.8
Sleeping pills	86	32.0
Anti-emetic	16	5.9
Others: (*Anti-convulsant, Anti-thyroid, Vaginal*	13	4.8

* Multiple responses

The practice of SM is presented in Table 5, showing that all respondents 269 (100%) reported engaging in it. Nearly half 132 (49.1%) self-medicated rarely, about one-third 89 (33.1%), sometimes, while a smaller proportion 27 (10.0%) reported doing so often. Most respondents obtained their medications from pharmacies, 191 (71.0%), while for 15 (5.6%), the drugs were readily available at home, or a combination of both sources, 63 (23.4%).

Table 5: Practice, frequency of Self-medication and Sources of medication.

Variable	Frequency (n=269)	Percentage (%)
Have you ever self-medicated?		
Yes	269	100
No	0	0.0
Frequency of self-medication		
Once	13	4.8
Rarely (2-3 times a year)	132	49.1
Sometimes (every few months)	89	33.1
Often (every few weeks)	27	10.0
Always	3	1.1
Sources of medication		
From pharmacy	191	71.0
Readily available at home	15	5.6
From pharmacy + Readily available at home	63	23.4

The most commonly self-medicated antibiotics were amoxicillin (63.9%), metronidazole (61.0%), ciprofloxacin (49.4%), the ampicillin and cloxacillin fixed-dose combination (46.8%) and penicillin (42.0%).

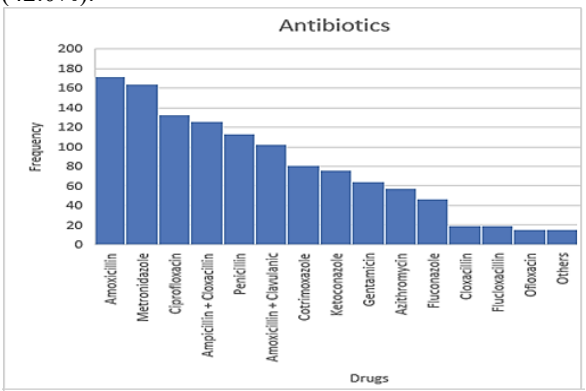

Figure 1: Commonly used antibiotics for Self-medication among study respondents

Table 6 shows that the frequency of SM was significantly associated with age, educational status, level of study, and self-rated health status (p = 0.020, 0.017, 0.008 & 0.002). Conversely, no significant associations were observed between gender, marital status and department of study (p = 0.236, 0.094, 0.391).

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Table 6: Associations Between Sociodemographic Characteristics and Frequency of Self-Medication

Variable	Frequency of Self-Medication						X^2	P-
N =269	Once	Rarely	Sometimes	Often	Always	Total		
Gender								
Male	9	62	33	9	1	155	5.538	0.236
Female	6	71	56	20	2	114		
Age								
17-20	0	24	17	6	3	50	40.204 [F F]	**0.020**
21-24	10	60	55	17	0	142		
25-28	4	24	15	3	0	46		
29-32	0	9	2	2	0	13		
≥ 33	1	16	0	1	0	18		
Marital Status								
Single	13	112	88		3	242	13.552 [F]	0.094
Married	2	20	1		0	26		
Widow	0	1	0		0	1		
Educational Status								
Undergraduate	14	117	89	27	3	250	11.995	**0.017**
Postgraduate	1	16	0	2	0	19		
Department								
Med & Surg.	11	79	61	21	1	173	12.708 [F]	0.391
Med. Lab. Sci.	1	10	7	1	0	19		
Nursing	1	38	15	5	2	61		
Physiotherapy	2	6	6	2	0	16		
Level								
200L	0	20	15	4	3	42	38.544 [F]	**0.008**
300L	2	19	14	4	0	39		
400L	6	45	34	10	0	95		
500L	5	23	18	3	0	49		
600L	1	12	8	7	0	28		
Postgraduate	1	14	0	1	0	16		
Health Status								
Fair	0	1	3	2	0	6 [F]	31.560	**0.002**
Good	0	25	32	6	1	64		
Very good	5	48	38	12	1	104		
Excellent	10	59	16	9	1	95		

*****Statistically significant p-value
X^2: Pearson Chi Square, **[F]**: Fisher's Exact Test

Discussion

This study assessed the practice of SM among healthcare students of the University of Ilorin, College of Health Sciences. Similar to earlier studies, a higher proportion of respondents were female, reflecting the gender distribution commonly observed in healthcare training and the workforce (Albusalih *et al.*, 2017). According to WHO (2022), almost 70% of health-care workers and nearly 90% of the nursing and midwifery workforce globally are women.

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The mean age was 24.3 years, and most of the respondents in the 21 to 24-year age group, which is similar to earlier studies involving undergraduate and early postgraduate health science students (Aqeel *et al*., 2014, Subashini *et al*. 2020). The majority, being single undergraduates highlights the youthful nature of the study population, which is comparable to findings from other similar studies (Erwin *et al*., 2019).

Most respondents (74%) rated their health as very good or exceptional, which reflects the general belief that young people are usually healthy. In reality, this perception may not be always true. According to WHO (2019), many health conditions at this period of life may not be apparent and can be easily ignored because of a general feeling of wellness. This can create a false impression of perfect health even when there may be underlying conditions and unaddressed risks. It is very important to note that this stage of life also offers a critical opportunity to build healthy lifestyles and habits that can shape long-term wellbeing.

The common symptoms warranting SM in this study were headache, malaria symptoms, cough and cold and fever, and gastrointestinal symptoms. These findings were in tandem with the common causes of SM reported in studies conducted by Jibo *et al*. (2021) among University Students in Northern Nigeria and Subashini &Udayanga (2020) among university students of Sri Lanka. This consistency implies that self-medication for these symptoms is a widespread occurrence among healthcare students and the community at large.

The belief that symptoms were mild, previous medication experience, urgency of the health problem, reliance on academic knowledge convenient access to medicines, cost of consultation, long waiting time and people's advice were the main causes of self-medication. This is similar to findings from studies by Misau *et al*. (2020) in medical college in Bauchi, North-East, Nigeria, and Olorunfemi *et al*. (2020) among student nurses in University of Benin Teaching Hospital, Edo State, South-South, Nigeria. Similar reasons were also cited amongst medical students of the University of Nigeria Enugu, South-East Nigeria (Idoko *et al*., 2022), and Jordanian universities students (Salma *et al*., 2025).

These factors reflect both systemic challenges and barriers to healthcare access which may discourage formal health-seeking behaviour. Also, reliance on academic knowledge and prior experiences which reflect overconfidence in self-diagnosis and treatment, can increase the risks of mismanagement, drug resistance, or adverse drug reactions. Addressing this issue requires a multiprong approach to improve healthcare accessibility and targeted education on the dangers of self-education among these future health professionals. Furthermore, the inclusion of the students in the Tertiary Institution Social Health Insurance Programme (TISHIP), under the National Health Insurance Authority (NHIA) will be a positive step towards improving students' access to healthcare services (Daramola *et al*., 2025), thereby reducing reliance self-medication.

Furthermore, common self-medicated drug classes were analgesics and antibiotics, a pattern observed across studies regardless of demographic or geographic setting (Akande-Sholabi *et al*., 2021; Alshammari *et al*., 2024; Lekhak *et al*., 2024). The high rate of antibiotic SM contributes to antimicrobial resistance (Popoola *et al*., 2024). Amoxicillin, metronidazole, and ciprofloxacin were the most frequently used in this study, consistent with a national survey in Nigeria, which reported amoxicillin (54.2%), metronidazole (48.2%), and ciprofloxacin (45.6%) as the most commonly self-medicated antibiotics (Popoola *et al*., 2024). Despite the awareness of the dangers of antibiotic misuse, SM remains a major public health issue, as a rising and unchecked resistance may limit treatment options significantly, increasing treatment costs, and worsen clinical outcomes. Addressing this requires stricter regulation of the sales of antibiotic and other medications, enforcement of prescription policies, more public education and enlightenment, and making healthcare access easy to reduce reliance on self-medication.

No significant difference was found between gender, marital status and department of study and self-medication. This may be due to similar knowledge levels among the respondents. This contrasts with findings by Shawi *et al*. (2018) and Olorunfemi *et al*. (2020), who reported higher SM rates among male and female students respectively. However, several studies have found a higher prevalence of SM in female students compared to males (Niwandinda *et al*., 2020; Behzadifar *et al*., 2020; Malli *et al*., 2023). According to Misau *et al*. (2020), higher SM rates among females might be due to their greater vulnerability to stress and anxiety.

The significant association of SM with age, educational status, level of study. SM was more common among the younger age groups in this study. In contrast, some researchers found no connection between SM and age (Agbesanwa *et al*., 2024, Adeshina *et al*., 2022).

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Undergraduates were more also likely to practice SM and this aligns with other earlier studies by Shawi *et al*. (2018) and Popoola *et al*. (2024). However, the small number of postgraduate students in this study may partly explain this pattern, as it limits the power to detect significant differences between the groups. It is also possible that postgraduate students, being older and more experienced, may have greater health knowledge. They may also be more financially stable, and hence able to seek professional care rather than rely on self-medication, compared to their younger undergraduate counterparts.

The was no significant association between frequency of SM and students' department, suggesting that this is not a major determinant of this behaviour. However, SM was significantly associated with self-reported health status, with higher rates observed among those who considered their health good or very good. This may reflect a sense of confidence in managing minor ailments independently among these set of people. Though, this may reduce unnecessary healthcare seeking and medical consultations, it carries the risk of overlooking potentially serious conditions, promoting inappropriate medication use and delaying appropriate treatment.

These findings highlight the need for targeted health education and interventions that emphasize the limitations of self-care, even among individuals who perceive themselves as healthy. Hence, universities and health authorities should include awareness campaigns on SM in the academic curriculum strengthen access to student-friendly healthcare services, including health insurance cover and tighten unrestricted access to medicines.

Conclusion

SM is a persistent problem and commonly practiced among university healthcare students, involving the use of various classes of drugs. To address this issue, efforts should be geared towards educating students on rational use of medicine and dangers of SM and enforcing prescription policies to regulate drug sales especially in community pharmacies. Furthermore, integrating the students into the Tertiary Institution Social Health Insurance Programme (TISHIP), under The National Health Insurance Authority (NHIA) will be a positive step towards improving students' access to healthcare services and reducing reliance on self-medication.

Limitations of the Study

The study was conducted in only one University, among healthcare students and geo-political zone, which may limit the generalizability of the findings to other Universities, students and regions across the country. However, this study has contributed valuable insights, data, and references for future consultation and comparative purposes. This study will also stimulate further studies within the healthcare system in Nigeria and beyond and chart a course on rational use of medicine among students and the general populace.

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Authors Contributions

The names of all authors listed in this work contributed equally to the conceptualization, design, manuscript writing and proofreading.

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Conflicts of interest

The authors declare no conflict of interest.

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