Prevalence and Factors Associated with Self-Medication of Antibiotics among University of Kigali Students in Rwanda

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Abstract: The study investigated the growing issue of self-medication with antibiotics among students at the University of Kigali, a practice contributing significantly to antimicrobial resistance (AMR). AMR poses a serious global threat, with the World Health Organization (WHO) warning it could lead to 10 million deaths annually by 2050 if left unchecked. In Rwanda, self-medication is widespread among university students, influenced by financial limitations, easy access to antibiotics, and inadequate health awareness. Despite global attention to this issue, limited research has focused on the Rwandan university context. Using a quantitative cross-sectional design, data were collected from 235 systematically selected students across various faculties and levels through structured questionnaires. Analysis in SPSS version 25 involved descriptive and logistic regression methods. Most respondents were aged between 24 and 26 years (45.5%), and males constituted the majority (61.3%). The findings revealed a high prevalence (69.4%) of antibiotic self-medication. The common ailments prompting self-treatment were coughs, colds, and flu (57.7%), followed by sore throat (26.4%). The most frequently used antibiotics included amoxicillin (53.4%), metronidazole (30.7%), and azithromycin (11.0%). Knowledge regarding antibiotic use was generally moderate (86.4%), while attitudes were neutral (77.9%) and perceptions poor (60.4%). Regression results indicated that sufficient monthly income, financial constraints leading to occasional self-medication, preference for managing minor illnesses independently, and reliance on prior experience were significant predictors of self-medication. Conversely, students who distrusted pharmacists dispensing antibiotics without prescriptions were less likely to self-medicate. The study concluded that self-medication with antibiotics is alarmingly prevalent among University of Kigali students, primarily influenced by socio-economic factors, accessibility of antibiotics, and self-reliant health behaviors. Despite moderate knowledge levels, poor attitudes and perceptions persist, highlighting the need for targeted interventions. The study recommends integrating rational antibiotic use into university health education programs, conducting regular awareness campaigns, enforcing stricter regulations on antibiotic sales, and ensuring that pharmacies dispense antibiotics only upon valid prescriptions while educating the public on responsible use.

Keywords: Prevalence, Self-Medication, Antibiotics, University of Kigali, Students, Rwanda.

I. INTRODUCTION

Self-medication with antibiotics (SMA) is a major problem for public health around the world because it leads to the development of antimicrobial resistance (AMR). Antimicrobial resistance (AMR) is a major cause of death around the world each year, according to the World Health Organization (WHO). One of the main ways people do this is by misusing and overusing antibiotics, especially when they try to treat themselves. Self-medication is common in both developed and developing countries. Depending on the area, the rate can be anywhere from 20% to 60%. In South-East Asia, a study found SMA rates as high as 78% among individuals who perceived they had prior experience with antibiotics (Saha et al., 2023). Similarly, in Africa, (Bouqoufi et al., 2024) reported that 55% of Nigerian students practiced SMA due to ease of access and inadequate health literacy.

In Europe, the rates are lower due to stricter regulations, but self-medication still happens, with 7-35% of people in countries like Spain, Italy, and Greece reporting the practice (Saha et al., 2023). Over-the-counter (OTC) antibiotics are easy to get in many low- and middle-income countries, which makes the problem worse and makes the global health disaster worse. Antimicrobial resistance (AMR), a global health disaster that mostly affects low-income areas like Africa (Bouqoufi et al., 2024), is made worse by the wrong use of antibiotics. SMA has very bad effects on people's health.

The World Health Organization (WHO) says that drug-resistant infections already kill about 700,000 people a year in Africa, which is a big problem for emerging medicines. It's harder to stop people from abusing antibiotics because there aren't many health education programs and drugs aren't regulated very well. SMA is becoming more common in many African countries because it is easy to get antibiotics without a prescription and people don't know how dangerous it is to abuse them. Research has shown that this is especially common among students and young people, who often treat common illnesses like colds, fevers, and diarrhea based on what they've heard from others or what they did in the past (Kariuki et al., 2022).

In countries like Rwanda, Kenya, Uganda, and Tanzania, antibiotics can often be obtained without a prescription, leading to inappropriate use(Gabriel et al., 2021). Factors such as the high cost of healthcare, long waiting times, and perceived effectiveness of antibiotics push individuals, particularly University of Kigali students and the general public, toward self-medicating practices (Gabriel et al., 2021). This has serious implications for antimicrobial resistance (AMR), as bacteria evolve to resist commonly used drugs, making infections harder to treat. Research shows that in East Africa, poor regulatory enforcement allows pharmacies and drug vendors to sell antibiotics freely, further exacerbating the problem (Sono et al., 2023).

This problem is especially bad for college students, who are more likely to take part in SMA because they are under a lot of stress with school, don't have much free time, and don't know much about medicines (Ikwara et al., 202). In Rwanda, the availability of antibiotics over-the-counter without proper prescriptions and the ease of access to these medications from informal drug markets have contributed to the widespread practice of SMA. In Rwanda, studies have highlighted that many individuals engage in self-medication, particularly in urban areas where pharmacies and informal drug outlets are more accessible (Tuyishimire et al., 2019). A significant portion of the population perceives antibiotics as a quick solution for common illnesses such as respiratory infections, which may not always require antibiotic treatment (Uwimana & Ntaganira, 2019). Due to lack of money, knowledge about the dangers of abusing antibiotics, and tough access to medical workers, especially in rural areas (Ndayisenga et al., 2024), people act in this way. There aren't many strict rules about selling medicines in Rwanda, which makes people more likely to self-medicate.

Though the Rwandan government has made efforts to regulate pharmacies and strengthen healthcare systems, enforcement remains a challenge, particularly in informal markets. The risks of SMA are very high because using antibiotics incorrectly can cause bad side effects and treatment failures. Antimicrobial resistance (AMR) is a big problem in Rwanda and around the world because it makes antibiotics less effective at treating bacterial infections, which means longer hospital stays, higher medical costs, and higher death rates (Ntirenganya et al., 2015).

II. METHODOLOGY

Research Design

This study employed a quantitative research approach to determine the prevalence of self-medication among University of Kigali students and to identify the factors associated with this practice. A cross-sectional descriptive design was used to assess how common self-medication with antibiotics is among these students. This design was appropriate because it allowed data collection at a single point in time, providing a clear and comprehensive snapshot of the self-medication practices within the target population.

Location of the Study

The study was conducted at University of Kigali students Rwanda. The university is located in Kigali, the capital and largest city of Rwanda, which served as the country's economic, political, and educational hub (University of Rwanda profile, 2020).

Targeted Study Population

The target population for this study consisted of approximately 600 students enrolled at Universities in Kigali, Rwanda.

Sampling Size

When conducting research, it was hardly ever possible to study the entire population. Therefore, researchers used samples when they seek to collect data and answer research questions, (Creswell ,2017). To calculate the sample size for a study involving these schools, the researcher used Fisher's formula, which was commonly applied in social and health research when estimating a representative sample size for a given population. The formula is:

$$n = \frac{Z^2 \times p \times (1-p)}{d^2}$$

where:

-      n = the desired sample size if the population was over 10,000

-      Z = Z-score (the value corresponding to the confidence level, typically 1.96 for a 95% confidence level)

-      p = estimated proportion of the population with the attribute of interest (if unknown, use 0.5 to maximize the sample size)

-      d = margin of error (often set at 0.05 for 5%)

n= $[(1.96)^2 * 0.5 *(1-0.5)]/(0.05)^2$

n= 0.9604/0.0025= **384.16**

Since the population in this case (600 students) was under 10,000, the researcher adjusted **n** using the finite population correction (FPC):

$$n_f = \frac{n}{1 + \left(\frac{n-1}{N}\right)}$$

where:

-      n_f = adjusted sample size for a finite population

-      N= total population size (in this case, 600)

n= 384.16/[1+(384.16-1)/600] = 384.16/1.5488 = **234.5**

This means that to obtain statistically significant results, **235 students** was surveyed from the 600-student population from Universities ok Kigali students for the intake of year 2025.

Research Instruments

A structured online questionnaire sent through Google Forms was used for the project. It had both closed questions so that it could get numeric data.

Data Analysis and Presentation

For this study, the data analysis was done in a planned way to make sure the results were understood correctly. When the data collection was over, they were put into statistical tools like SPSS version 25 (Statistical Package for the Social Sciences).

III.   RESULTS

3.1 Demographic Characteristics of Respondents

Table 1: Demographic Characteristics of Respondents

Variables	Frequency (n=235)	Percent %)
Age group		
18–20	3	1.3
21–23	25	10.6
24–26	107	45.5
Above 26	100	42.6
Sex		
Male	144	61.3
Female	91	38.7
Marital Status		
Single	178	75.7
Married	51	21.7
Divorced	5	2.1
Widow	1	0.4
Year of study		
Year 1	24	10.2
Year 2	23	9.8
Year 3	117	49.8
Year 4 +	71	30.2
School/Faculty		
Business	42	17.9
IT	60	25.5
Law	46	19.6
Education	70	29.8
Others	17	7.2
Residence type		
Off-campus	68	28.9
With family	167	71.1
Health insurance		
Yes	204	86.8
No	31	13.2
Monthly income		
<50k	32	13.6
50–80k	81	34.5
80–100k	77	32.8
>100k	45	19.1
Distance to nearest pharmacy		
<1 km	150	63.8
1–3 km	65	27.7
>3 km	20	8.5

Source: (Primary data, 2025)

Table 1 shows that 235 students from the University of Kigali took part in the study. Age, sex, marital status, year of study, school or department, type of residence, health insurance status, monthly income, and distance to the nearest pharmacy were some of the things that were looked at. The age groups of most responses were between 24 and 26 years old (107, or 45.5%), followed by those over 26 years old (100, or 42.6%). The smallest age group was 18–20 years 3 (1.3%), while 21–23 years accounted for 25 (10.6%). Males represented 144 (61.3%) of the sample, while females accounted for 91 (38.7%).

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Most students were single 178 (75.7%), with smaller proportions being married 51 (21.7%), divorced 5 (2.1%), or widowed 1 (0.4%). Regarding academic level, nearly half were in their third year 117 (49.8%), while 71 (30.2%) were in year four or higher, 24 (10.2%) in year one, and 23 (9.8%) in year two.

Participants were mostly from the Education faculty 70 (29.8%), followed by IT 60 (25.5%), Law 46 (19.6%), Business 42 (17.9%), and other faculties 17 (7.2%). In terms of living arrangements, the majority lived with family 167 (71.1%), while 68 (28.9%) resided off-campus. A high proportion reported having health insurance 204 (86.8%), compared to those without 31 (13.2%). Regarding monthly income, 81 (34.5%) earned between RWF 50k–80k, 77 (32.8%) earned RWF 80k–100k, 45 (19.1%) earned above RWF 100k, and 32 (13.6%) earned less than RWF 50k. The distance to the nearest pharmacy was less than 1 km for most respondents 150 (63.8%), followed by 1–3 km 65 (27.7%), and over 3 km 20 (8.5%), indicating relatively easy access to drug outlets.

3.2 Prevalence of Self-Medication with Antibiotics Among University Students

Table 2: Prevalence Of Self-Medication with Antibiotics Among University Students

Variable	Frequency	Percent
Self-medication category		
Self-medication	163	69.4
Not self-medication	72	30.6
Total	**235**	**100**

Source: (Primary data, 2025)

As presented in Table 2, out of 235 university students, 163 (69.4%) reported having self-medicated with antibiotics, while 72 (30.6%) had not. This meant that nearly 7 in 10 students practiced self-medication, making it more than twice as common as non-self-medication. The high prevalence suggested that self-medication was widespread among students, likely due to factors such as easy access to antibiotics, perceived knowledge, and convenience compared to seeking formal care.

3.1.1 Distribution of Conditions for Self-Medication with Antibiotics

Both Table 3 presents the distribution of specific health conditions for which university students reported self-medicating with antibiotics.

Table 3: Distribution Of Conditions for Self-Medication with Antibiotics Among University Students

Variable	Self-Medication Category	
Condition For Self-Medicate	**Self-Medication**	**Not Self-Medication**
sore throat	43 (26.4)	0 (0.0)
Cough/cold/flu	94 (57.7)	11 (15.3)
Diarrhea	12 (7.4)	3 (4.2)
Urinary tract infection	9 (5.5)	17 (23.6)
Toothache	2 (1.2)	16 (22.2)
Other	3 (1.8)	25 (34.7)

As shown in Table 3 above, the most common condition for which students practiced self-medication with antibiotics was cough, cold, or flu, reported by 94 (57.7%) students. This was followed by sore throat, 43 (26.4%), and diarrhea, 12 (7.4%). Fewer students reported using antibiotics without prescription for urinary tract infections, 9 (5.5%), toothache, 2 (1.2%), and other unspecified conditions, 3 (1.8%).

3.1.2 Distribution of Types of Antibiotics Used by University Students

Table 4: Types of Antibiotics used by Self-Medicated

	Self-Medication Category	
Variable	**Self-Medication**	**Not Self-Medication**
Types of antibiotics used		
Azithromycin	18 (11.0)	4 (5.6)
Amoxicillin	87 (53.4)	18 (25.0)
Metronidazole	50 (30.7)	30 (41.7)
Others	8 (4.9)	20 (27.8)
Total	**163 (100.0)**	**72 (100.0)**

Table 4. presents the types of antibiotics used by university students who self-medicated and those who did not. The table includes both the frequency and percentage distribution within each group. As indicated in Table 4, Amoxicillin was the most commonly used antibiotic among students who self-medicated, accounting for 53.4% of that group. This was followed by Metronidazole (30.7%) and Azithromycin (11.0%)

Figure 1: Bar Chart Showing Distribution of Types of Antibiotics Used by Self-Medicated
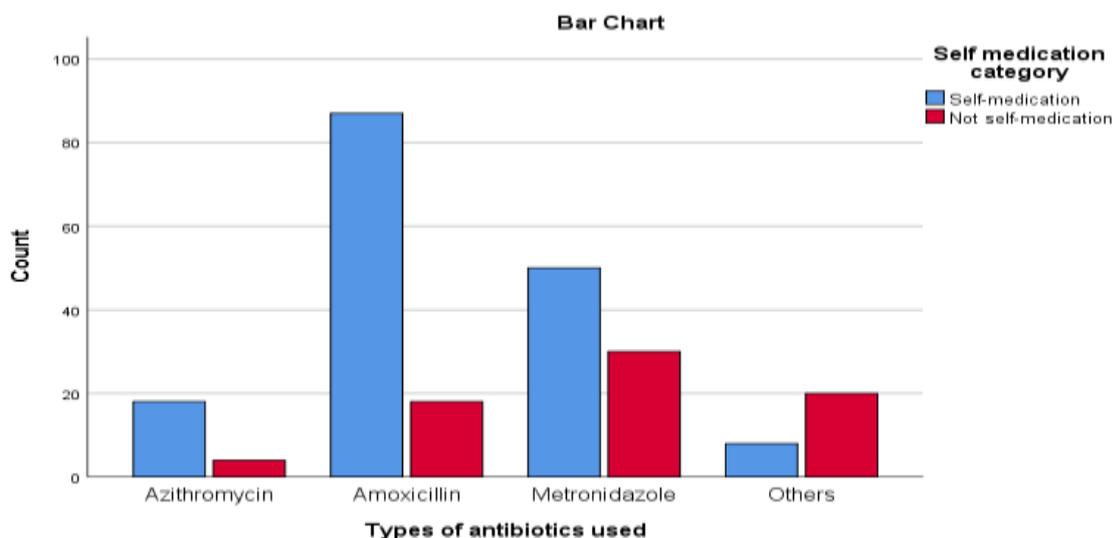
As presented in Figure 1 above the most commonly used antibiotic among self-medicating students was Amoxicillin, reported by 87 (53.4%), followed by Metronidazole, 50 (30.7%), and Azithromycin, 18 (11.0%). A smaller proportion, 8 (4.9%), reported using other antibiotics. Among students who did not self-medicate, the most frequently reported antibiotic when prescribed by a health professional was Metronidazole, 30 (41.7%), followed by Amoxicillin, 18 (25.0%), and other antibiotics, 20 (27.8%). Only 4 (5.6%) reported using Azithromycin. These results indicated that Amoxicillin was the antibiotic most frequently used for self-medication, while Metronidazole was the leading antibiotic prescribed to those who sought professional care.

3.2 Knowledge, Attitudes, And Perceptions regarding the Risks and Consequences of Self-Medication

This objective presented the categorization of students' knowledge, attitude and perception levels on the risks and consequences associated with the self-medication of antibiotics. The classification was based on cumulative scores obtained from the knowledge-attitude and perceptions in the questionnaire.

3.2.1 Knowledge Categorization on Risks and Consequences of Self-Medication with Antibiotics among University Students

To assess students' knowledge regarding the risks and consequences of self-medication with antibiotics, scores were categorized using standard percentage cut-offs: 0–40% (Poor), 41–70% (Moderate), and 71–100% (Good). Each student's knowledge score was converted to a percentage, and then classified accordingly with means of 1.8894 and SD of 0.35.

Table 5: Categorized Knowledge Levels Regarding Risks and Consequences of Antibiotic Self-Medication

Variable	Frequency	Percent
Categorize Knowledge Level		
Poor Knowledge (0–40%)	29	12.3
Moderate Knowledge (41–70%)	203	86.4
Good Knowledge (71–100%)	3	1.3
Total	**235**	**100**

Table 5, shows that the majority of the respondents (86.4%) had moderate knowledge regarding the risks and consequences of self-medicating with antibiotics. Only 1.3% of the students demonstrated good knowledge, while 12.3% had poor knowledge.

Table 6: Categorization of Students' Attitudes toward Self-Medication with Antibiotics

Variable	Frequency	Percent
Attitude category		
Negative Attitude	52	22.1
Neutral Attitude	183	77.9
Total	**235**	**100**

The different ways that students felt about the risks and effects of self-medication with antibiotics are shown in Table 6. Based on a 5-point Likert scale, the attitude results were put into three groups: negative attitude (1.00–2.49), neutral attitude (2.50–3.49), and positive attitude (3.50–5.00). Seventy-seven percent of the students were not sure how they felt about the risks and effects of self-medication with antibiotics. A smaller proportion (22.1%) exhibited a negative attitude, while no respondents fell into the positive attitude category, indicating a lack of strong concern or positive perception of the dangers of antibiotic self-medication.

3.2.2 Students' Perception Levels Towards Self-Medication with Antibiotics

Table 7: Categorization of Students' Perception Levels on Risks and Consequences of Self-Medication

Variable	Frequency	Percent
Perception Score		
Poor perception	142	60.4
Moderate perception	92	39.1
Good perception	1	0.4
Total	**235**	**100**

In Table 7, you can see a summary of how the students felt about the risks and effects of self-medication with antibiotics. Using % cut-offs, perception scores were put into three groups: 0.4% to 40% = Poor, 41.4% to 70% = Moderate, and 71.4% to 100% = Good. As shown in Table 4.7, most of the students (60.4%) didn't think well about the risks and effects of self-medicating with antibiotics. A smaller group, 39.1%, had a moderate perception, and only 0.4% had a good image.

3.2.3 Summary on Assessment of Students' Knowledge, Attitudes, and Perceptions Regarding the Risks and Consequences of Self-Medication with Antibiotics

The assessment of students' knowledge, attitudes, and perceptions regarding the risks and consequences of self-medication with antibiotics revealed varied levels of awareness and concern. As presented in Table 5, the majority of students (86.4%) demonstrated moderate knowledge, while 12.3% had poor knowledge and only 1.3% exhibited good knowledge, indicating a general awareness but limited depth of understanding. Table 4.6 showed that 77.9% of the participants held a neutral attitude, and 22.1% had a negative attitude, with none expressing a positive attitude, suggesting limited concern or engagement with the issue.

Furthermore, Table 7 indicated that most students (60.4%) had a poor perception of the risks associated with antibiotic self-medication, 39.1% had moderate perception, and a mere 0.4% showed good perception. Overall, while students appeared moderately informed, their neutral attitudes and poor perceptions highlighted the need for enhanced educational efforts to improve their critical understanding and risk recognition regarding antibiotic misuse.

3.3 Factors Influencing Self-Medication of Antibiotics Among Students, Including Socio-Economic, Academic, And Behavioral Aspects

Table 8: Factors of Socio-Economic, Academic, and Behavioral Factors Influencing Self-Medication with Antibiotics among Students

Variables	Frequency	Percent
Cost of consultation is a barrier		
Yes	165	70.2
No	70	29.8
Monthly income sufficient for medical care		
Yes	69	29.4
No	166	70.4

Insurance reduces need to self-medicate

Yes	191	81.3
No	39	16.6
Not sure	5	2.1

Frequency of self-medication due to lack of funds

Never	42	17.9
Sometimes	128	54.5
Often	65	27.7

Ease of pharmacy access

Very easy	183	77.9
Moderate	38	16.2
Difficult	14	6.0

Academic pressure limits healthcare seeking

Yes	172	73.2
No	63	26.8

Self-medicated during exams

Yes	42	17.9
No	193	82.1

Received formal education on antibiotics

Yes	52	22.1
No	183	77.9

Source of antibiotic knowledge

Lectures	6	2.6
Internet	77	32.8
Friends/family	116	49.4
Past prescriptions	36	15.3

Academic background helps assess antibiotic need

No	113	48.1
Yes	73	31.1
Not sure	49	20.9

Prefer self-management for minor illness

Strongly Agree	67	28.5
Agree	57	24.3
Neutral	33	14.0
Disagree	39	16.6
Strongly Disagree	39	16.6

Use past experiences to choose antibiotics

Strongly Agree	61	26
Agree	71	30.2
Neutral	38	16.2
Disagree	46	19.6
Strongly Disagree	19	8.1

Trust pharmacists without prescription

Strongly Agree	43	18.3
Agree	108	46.0
Neutral	26	11.1
Disagree	35	14.9

Strongly Disagree	23	9.8
Okay to stop antibiotics when feeling better		
Strongly Agree	64	27.2
Agree	40	17.0
Neutral	15	6.4
Disagree	84	35.7
Strongly Disagree	32	13.6
Share antibiotics with others		
Strongly Agree	47	20.0
Agree	18	7.7
Neutral	31	13.2
Disagree	115	48.9
Strongly Disagree	24	10.2

In Table 8, the socio-economic, academic, and behavioral factors that affect college students' choice to self-medicate with antibiotics are shown. A large percentage of students (70.2%) said that the cost of medical consultations kept them from getting professional help, and a similar number (70.6%) said that their monthly income wasn't enough to cover medical costs. Eighteen percent of the students agreed that having insurance made them less likely to self-medicate. 54.5% of students sometimes self-medicated when they didn't have enough money, and 27.7% often did.

The majority (77.9%) found it very easy to access a pharmacy. Academically, 73.2% believed that tight schedules hindered their ability to seek healthcare, and only 22.1% had received formal education on antibiotic use. Friends and family were the main sources of antibiotic knowledge for nearly half of the students (49.4%). Behaviorally, 52.8% preferred to manage minor illnesses independently, and 56.2% reported relying on past experiences to choose antibiotics. Alarmingly, 64.3% trusted pharmacists even without a prescription, and 44.2% believed it was acceptable to stop antibiotics once feeling better.

3.4. Bivariate and Multivariate Analysis of Factors Influencing Self-Medication of Antibiotics Among Students

To further understand the determinants of self-medication with antibiotics among students, both bivariate and multivariate analyses were conducted. Bivariate analysis was first used to explore the relationship between each independent variable (socio-economic, academic, and behavioral factors) and the dependent variable (self-medication behavior). This helped identify variables with statistically significant associations. Following this, multivariate analysis using binary logistic regression was performed to assess the combined effect of these factors and determine which ones independently predicted self-medication when controlling for others. This approach provided a more comprehensive view of the most influential predictors of antibiotic self-medication among students.

Table 9: Bivariate and Multivariate Logistic Regression of Factors Influencing Self-Medication of Antibiotics among Students

Variables	Items	95.0% CI for COR	P-value	95.0% CI for OR	P-value
Cost of consultation is a barrier	Yes	1.044 (0.568 - 1.918)	0.89	0.508 (0.15 - 1.719)	0.276
	No	Ref (-)		Ref (-)	
Monthly income sufficient for medical care	Yes	2.985 (1.649 - 5.402)	**<0.001**	15.545 (2.626 - 92.014)	**0.002**
	No	Ref (-)		Ref (-)	
Insurance reduces need to self-medicate	Yes	0.109 (0.012 - 0.997)	0.05	0.022 (0 - 3.89)	0.148
	No	0.086 (0.009 - 0.865)	**0.037**	0.012 (0 - 2.34)	0.1
	Not sure	Ref (-)		Ref (-)	
Frequency of self-medication due to lack of funds	Never	4.408 (1.52 - 12.782)	**0.006**	4.648 (0.547 - 39.524)	0.159
	Sometimes	6.949 (2.796 - 17.272)	**<0.001**	22.859 (3.89 - 134.323)	**0.001**
	Often	Ref (-)		Ref (-)	

Ease of pharmacy access	Very easy	1.019 (0.306 - 3.393)	0.975	12.101 (1.161 - 126.18)	**0.037**
	Moderate	1.63 (0.431 - 6.162)	0.471	4.856 (0.363 - 65.002)	0.233
	Difficult	Ref (-)		Ref (-)	
Academic pressure limits healthcare seeking	Yes	0.843 (0.455 - 1.563)	0.588	0.71 (0.185 - 2.72)	0.617
	No	Ref (-)		Ref (-)	
Self-medicated during exams	Yes	0.887 (0.425 - 1.85)	0.749	0.833 (0.196 - 3.533)	0.804
	No	Ref (-)		Ref (-)	
Received formal education on antibiotics	Yes	1.265 (0.658 - 2.432)	0.481	1.26 (0.28 - 5.666)	0.763
	No	Ref (-)		Ref (-)	
Source of antibiotic knowledge	Lectures	0.625 (0.101 - 3.858)	0.613	0.12 (0.004 - 4.096)	0.239
	Internet	0.5 (0.22 - 1.138)	0.099	0.008 (0.001 - 0.095)	**<0.001**
	Friends/family	0.476 (0.22 - 1.032)	0.06	0.142 (0.022 - 0.931)	**0.042**
	Past prescriptions	Ref (-)		Ref (-)	
Academic background helps assess antibiotic need	Yes	1.517 (0.722 - 3.187)	0.271	4.409 (0.957 - 20.309)	0.057
	No	0.974 (0.428 - 2.216)	0.951	2.05 (0.383 - 10.958)	0.401
	Not sure	Ref (-)		Ref (-)	
Prefer self-management for minor illness	Strongly Agree	7.535 (2.409 - 23.571)	**0.001**	74.995 (8.694 - 646.895)	**<0.001**
	Agree	5.919 (1.852 - 18.918)	**0.003**	5.205 (0.814 - 33.281)	0.081
	Neutral	3.281 (0.906 - 11.887)	0.07	17.629 (1.811 - 171.588)	**0.013**
	Disagree	1.287 (0.318 - 5.202)	0.724	0.429 (0.04 - 4.63)	0.485
	Strongly Disagree	Ref (-)		Ref (-)	
Use past experiences to choose antibiotics	Strongly Agree	2.602 (0.679 - 9.976)	0.163	10.866 (0.581 - 203.166)	0.11
	Agree	3.273 (0.872 - 12.287)	0.079	99.887 (4.152 - 2402.929)	**0.005**
	Neutral	5.333 (1.332 - 21.357)	**0.018**	10.415 (0.539 - 201.271)	0.121
	Disagree	0.372 (0.068 - 2.037)	0.254	0.897 (0.042 - 19.216)	0.945
	Strongly Disagree	Ref (-)		Ref (-)	
Trust pharmacists without prescription	Strongly Agree	2.779 (0.547 - 14.127)	0.218	0.221 (0.014 - 3.468)	0.283
	Agree	10.896 (2.435 - 48.768)	**0.002**	8.826 (0.923 - 84.362)	0.059
	Neutral	2.5 (0.435 - 14.355)	0.304	0.244 (0.013 - 4.406)	0.339
	Disagree	0.309 (0.026 - 3.619)	0.349	0.02 (0.001 - 0.715)	**0.032**
	Strongly Disagree	Ref (-)		Ref (-)	
Okay to stop antibiotics when feeling better	Strongly Agree	0.197 (0.065 - 0.601)	**0.004**	0.322 (0.038 - 2.729)	0.299
	Agree	0.405 (0.136 - 1.21)	0.105	0.075 (0.009 - 0.615)	**0.016**
	Neutral	0.477 (0.111 - 2.056)	0.321	1.807 (0.099 - 32.981)	0.69
	Disagree	2.203 (0.945 - 5.134)	0.067	8.253 (1.233 - 55.224)	**0.03**
	Strongly Disagree	Ref (-)		Ref (-)	
Share antibiotics with others	Strongly Agree	0.35 (0.109 - 1.126)	0.078	1.316 (0.114 - 15.193)	0.826
	Agree	0.25 (0.046 - 1.365)	0.109	12.409 (0.536 - 287.159)	0.116
	Neutral	1.1 (0.358 - 3.382)	0.868	12.79 (1.067 - 153.264)	**0.044**
	Disagree	1.239 (0.49 - 3.136)	0.65	3.082 (0.398 - 23.862)	0.281
	Strongly Disagree	Ref (-)		Ref (-)	

Source: Primary data, 2025)

Table 9 shows the results of a logistic analysis that found a number of social, economic, and behavioral factors that were significantly linked to college students self-medicating with antibiotics. An adjusted odds ratio (AOR) of 15.545, 95% CI = [2.626, 92.014], p = 0.002 showed that students with enough monthly income were much more likely to self-medicate than those without. Also, students who said they sometimes self-medicated because they didn't have enough money were much more likely to do so than students who said they often did so (AOR = 22.859, 95% CI = [3.890, 134.323], p = 0.001). Furthermore, students who indicated that accessing a pharmacy was "very easy" had increased odds of self-medicating (AOR = 12.101, 95% CI = [1.161, 126.180], p = 0.037), implying that proximity and ease of access to medication sources influenced this behavior.

In terms of behavioral influences, students who strongly preferred managing minor illnesses on their own were significantly more likely to self-medicate (AOR = 74.995, 95% CI = [8.694, 646.895], p < 0.001), and those who agreed with this preference also showed elevated odds (AOR = 5.205, 95% CI = [0.814, 33.281], p = 0.081). Similarly, students who agreed with using past experience to select antibiotics were highly likely to self-medicate (AOR = 99.887, 95% CI = [4.152, 2402.929], p = 0.005). People who didn't trust pharmacists who didn't have prescriptions were much less likely to self-medicate (AOR = 0.020, 95% CI = [0.001, 0.715], p = 0.032), which shows that being skeptical about advice that doesn't come from a prescription can help. Also, students who agreed that stopping antibiotics when they felt better were less likely to self-medicate (AOR = 0.075, 95% CI = [0.009–0.615], p = 0.016), which suggests that knowing some about how antibiotics can be misused may make people act more responsibly. These results show that both structural and personal factors are very important in why kids self-medicate.

IV. DISCUSSION OF RESEARCH FINDINGS

This section discusses and interprets the results of the study in relation to existing literature on antibiotic self-medication. The discussion focuses on key themes such as the prevalence, knowledge, attitudes, and socio-economic factors influencing self-medication practices among university students. It also situates the study within the broader public health context and compares it with previous research to enhance understanding of antibiotic misuse and its implications.

Prevalence of Self-Medication with Antibiotics among University Students

The prevalence of antibiotic self-medication among university students has been widely reported across different contexts, particularly in low- and middle-income countries. Studies in Uganda (Ocan et al., 2015) and Ethiopia (Abay & Amelo, 2019) have revealed high levels of self-medication, suggesting that this behavior is persistent and widespread across the region. Commonly, students self-treat conditions such as coughs, colds, flu, and sore throats, which are mostly viral and do not require antibiotic therapy. Similar patterns have been documented in Saudi Arabia and Nigeria (Zafar et al., 2018; Abdulraheem et al., 2019), emphasizing a general misconception about the appropriate use of antibiotics. The frequent use of broad-spectrum antibiotics, particularly Amoxicillin, has been highlighted in previous studies (Rather et al., 2017), raising global concerns about antimicrobial resistance, a challenge the World Health Organization (2019) considers one of the greatest threats to global health.

Students' Knowledge, Attitudes, and Perceptions Regarding Antibiotic Use

Existing research demonstrates that university students often possess only a moderate level of knowledge about antibiotic use, with limited understanding of the risks associated with misuse. Similar findings have been reported in Nigeria and Ethiopia (Ajibola et al., 2018; Abay & Amelo, 2019), where students showed basic awareness but poor comprehension of antibiotic resistance mechanisms. Attitudes toward antibiotic use are often shaped by social and behavioral influences, including peer advice and personal experience, as observed by Ocan et al. (2015). Moreover, studies by Rather et al. (2017) and Zafar et al. (2018) suggest that easy access to antibiotics and informal information sources reduce awareness of the risks associated with self-medication. These insights indicate that knowledge alone does not necessarily promote responsible antibiotic use, highlighting the need for effective behavioral change interventions and targeted health education programs.

Socio-Economic and Behavioral Factors Influencing Self-Medication

Socio-economic and behavioral determinants play a significant role in shaping students' decisions to self-medicate. Previous studies have identified factors such as income level, accessibility of pharmacies, and the convenience of self-treatment as key drivers of self-medication (Haque et al., 2019; Sapkota et al., 2017). Students with greater financial means or easier access to drug outlets are more likely to obtain antibiotics without prescriptions, especially where regulatory

enforcement is weak.Behavioral aspects, including self-reliance in managing minor illnesses, reliance on past experiences, and limited trust in healthcare providers, further encourage this practice (Zafar et al., 2018; Ocan et al., 2015). These factors collectively point to a complex interaction between socio-economic convenience, access, and attitudes, suggesting that interventions should address not only awareness but also the contextual and behavioral factors influencing antibiotic use.

V. CONCLUSION

The findings of the study revealed a high prevalence of antibiotic self-medication among university of Kigali students, with the majority using antibiotics without professional consultation. Most students showed moderate knowledge, but their attitudes and perceptions toward the risks and consequences of self-medication were largely neutral or poor. Several socio-economic and behavioral factors significantly influenced self-medication practices. Financial capacity, ease of access to pharmacies, autonomy in managing minor illnesses, and reliance on prior experience were key contributors.

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