

Medication Knowledge and Behaviors Related to Antibiotic and Anti-Inflammatory drug among Secondary School Students

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DOI: <https://doi.org/10.5281/zenodo.19724991>

Published Date: 24-April-2026

Abstract: This study assessed medication knowledge and self-medication behaviors among secondary school students, focusing on antibiotics and anti-inflammatory drugs. A total of 200 students completed an online questionnaire, and data were analyzed using descriptive statistics. Students demonstrated moderate knowledge. While 56.5% correctly identified that anti-inflammatory drugs are not antibiotics and 49.0% checked expiration dates, key misconceptions persisted: 63.0% did not recognize that antibiotics are unnecessary for viral infections, and only 34.5% understood the risk of antimicrobial resistance from incomplete use. Medication practices were generally appropriate. Most students did not discontinue medication prematurely (66.0%) or self-medicate without consultation (52.5%). Pharmacists (97.0%) and physicians (94.5%) were the primary information sources. These findings highlight persistent knowledge gaps despite generally appropriate behaviors, underscoring the need for targeted education on rational antibiotic use.

Keywords: Antibiotics; Anti-inflammatory drugs; Self-medication; Secondary school students; Drug use behavior; Antimicrobial resistance.

1. INTRODUCTION

Self-medication is a common practice in contemporary society, particularly among adolescents who have easy access to medications and health-related information. However, inadequate knowledge of appropriate drug use may lead to misuse, such as the inappropriate use of antibiotics for viral infections or the premature discontinuation of prescribed medications. These inappropriate practices may result in adverse drug reactions (ADRs) and contribute to antimicrobial resistance (AMR), a major global public health concern. Therefore, promoting rational drug use among students is essential. This study aimed to assess medication knowledge and self-medication behaviors among secondary school students and to examine the association between knowledge and medication-use practices.

2. METHODS

2.1 Study Design

This study employed a cross-sectional survey design.

2.2 Participants

The study included 200 secondary school students (Grades 7–12).

2.3 Data Collection

Data were collected an online questionnaire (Google Form). Participation was voluntary and anonymous.

The questionnaire consisted of four sections:

1. General information
2. Medication knowledge
3. Medication-use behavior
4. Scenario-based questions

2.4 Data Analysis

Data were analyzed using:

- * Descriptive statistics (frequency, percentage)
- * Mean values
- * Correlation analysis

3. RESULTS

Section 1: General Information (characteristics as Table 1-5)

TABLE 1: Grade level

Student Grade	Number of people	Percentage (%)
M.1	27	13.5
M.2	25	12.5
M.3	43	21.5
M.4	35	17.5
M.5	33	16.5
M.6	37	18.5

TABLE 2: Gender

Gender	Number of people	Percentage (%)
Male	75	37.5
Female	114	57.0
Other	11	5.5

TABLE 3: Age

Age	Number of people	Percentage (%)
Age 12	4	2.0
Age 13	24	12.0
Age 14	27	13.5
Age 15	42	21.0
Age 16	37	18.5
Age 17	35	17.5
Age 18	31	15.5

TABLE 4: Chronic conditions. (multi -select)

Chronic disease	Number of people	Percentage (%)
Asthma	8	4.0
Allergic conditions	17	8.5
Heart disease	2	1.0
Diabetes mellitus	1	0.5
None	169	84.5
Other	6	3.0

TABLE 5: Health problems experienced during the past 2 months. (multi -select)

Symptoms	Number of people	Percentage (%)
Headache / Toothache	34	17.0
Common cold	21	10.5
Purulent tonsillitis	18	9.0
Infected wound	5	2.5
Pain related to sports or physical activity	42	21.0
Rarely ill	133	66.5
Other	16	8.0

Section 1 summary: Participants were distributed across all grade levels, with the highest proportion in Grade 9. Most respondents were female. The majority were aged 15–17 years and reported no chronic diseases.

Section 2: Medication knowledge (characteristics as Table 6-12)

TABLE 6: Anti-inflammatory drugs are antibiotics. (single choice)

Option	Number of people	Percentage (%)
Yes	87	43.5
No	113	56.5

TABLE 7: Check the expiration date before using medication. (single choice)

Frequency	Number of people	Percentage (%)
Every time	52	26.0
Often	98	49.0
Sometimes	31	15.5
Rarely/Never	19	9.5

TABLE 8: Viral infections do not require the use of antibiotics. (single choice)

Option	Number of people	Percentage (%)
Yes	109	54.5
No	78	39.0
Other	13	6.5

TABLE 9: Incomplete use of antibiotics may contribute to antimicrobial resistance.(single choice)

Option	Number of people	Percentage (%)
Yes	69	34.5
No	126	63.0
Other	5	2.5

TABLE 10: Which of the following are antibiotics? (multi -select)

Option	Number of people	Percentage (%)
antipyretic analgesics	18	9.0
Antibiotics	69	34.5
Common cold medication	48	24.0
Prescription medication to be taken strictly as directed and completed	75	37.5

TABLE 11: Which nonsteroidal anti-inflammatory drugs (NSAIDs) have you used? (multi -select)

Option	Number of people	Percentage (%)
Ibuprofen	126	63.0
Aspirin	58	29.0
Other	43	21.5

TABLE 12: Which corticosteroids have you used? (multi -select)

Option	Number of people	Percentage (%)
Prednisone/Prednisolone	77	38.5
methylprednisolone	13	6.5
Other	55	27.5
Never/Unaware of the drug type	61	30.0

Section 2 summary: The findings indicate that while most students possess a moderate level of pharmacological literacy demonstrated by practices such as verifying expiration dates and recognizing the role of antibiotics in treating bacterial infections significant misconceptions persist. Specifically, some students incorrectly believe that antibiotics are effective against common viral infections and remain unaware of the risks associated with non-adherence, particularly antimicrobial resistance (AMR). Furthermore, although there is partial recognition of NSAIDs and corticosteroids, confusion regarding drug classifications remains prevalent. These gaps in knowledge underscore the necessity for school-based educational interventions to promote the rational and safe use of medicines.

Section 3: Medication-use behaviour (*characteristics as Table 13-18*)

TABLE 13: Self-purchasing of medication without professional consultation from physicians or pharmacists.

Frequency	Number of people	Percentage (%)
Every time	4	2.0
Often	32	16.0
Sometimes	59	29.5
Rarely/Never	105	52.5

TABLE 14: Patterns of medication reuse and premature discontinuation of prescribed courses.

Frequency	Number of people	Percentage (%)
Every time	5	2.5
Often	17	8.5
Sometimes	46	23.0
Rarely/Never	132	66.0

TABLE 15: Frequency of self-medication with antibiotics and anti-inflammatory drugs.

Frequency	Number of people	Percentage (%)
≤1 time/year	32	16.0
2-5 times/year	88	44.0
≥1 times/month	67	33.5
≥1 times/week	13	6.5

TABLE 16: Information sources influencing students' decision-making in medication use. (multi -select)

Option	Number of people	Percentage (%)
Pharmacists	194	97.0
Physicians	189	94.5
Online resources	14	7.0
Peers and family members	32	16.0

TABLE 17: Primary indications for the use of anti-inflammatory medications. (multi -select)

Option	Number of people	Percentage (%)
Headache and Myalgia	167	83.5
Inflammation characterized by edema and erythema	112	56.0
Dental pain and Dysmenorrhea	108	54.0
Other	19	9.5

TABLE 18: Procurement sources of medications utilized by students. (multi -select)

Option	Number of people	Percentage (%)
Household medicine cabinets	85	42.5
community pharmacies with licensed pharmacists.	175	87.0
Medications obtained from third parties	21	10.5
Residual medications from previous prescriptions	38	19.0
Other	13	6.5

Section 3 summary: The findings demonstrate that the majority of students exhibit moderate to high levels of appropriate medication-use behaviors. A significant proportion reported refraining from self-medication (52.5%) and completing prescribed courses without premature discontinuation (66.0%). Furthermore, the high reliance on pharmacists (97.0%) and physicians (94.5%) as primary information sources reflects strong access to professional medical guidance. However, certain high-risk behaviors persist, including self-purchasing of drugs, non-adherence to dosage regimens, and the utilization of residual or shared medications. Most students primarily utilized medication for pain management (83.5%), with community pharmacies serving as the predominant procurement source (87.5%).

Section 4: Scenario-based questions (*characteristics as Table 19-22*)

Behavioral Scenarios (Select the most appropriate response)

TABLE 19: If you experience common cold symptoms and a runny nose, which of the following actions would you take? (single choice)

Option	Number of people	Percentage (%)
Take antibiotics	31	15.5
Consult a physician	98	49.0
Take antipyretics for symptomatic relief	71	35.5

TABLE 20: What action would you take if you experience a severe sore throat accompanied by a high fever? (single choice)

Option	Number of people	Percentage (%)
Self-purchase medication	57	28.5
Take anti-inflammatory drugs	68	34.0
Take antibiotics	75	37.5

TABLE 21: If prescribed a course of antibiotics, how would you proceed once your symptoms improve? (single choice)

Option	Number of people	Percentage (%)
Discontinue the medication immediately	21	10.5
Continue the medication until the course is completed	167	83.5
Retain the remaining medication for future use	12	6.0

TABLE 22: What would you do if you are uncertain about how to use a specific medication? (single choice)

Option	Number of people	Percentage (%)
Consult friends or family members	23	11.5
Search for information online	11	5.5
Seek professional advice from a physician or pharmacist	166	83.0

Section 4 summary: The majority of students demonstrated appropriate decision-making regarding medication use across various scenarios. Most respondents opted to consult a physician, followed medical instructions, adhered strictly to the prescribed antibiotic courses, and sought professional advice from doctors or pharmacists when in doubt. Nevertheless, instances of unnecessary antibiotic use were still observed in certain cases.

4. DISCUSSION

The findings of this study indicate that students possess a certain level of knowledge regarding medication use; however, misconceptions remain in several aspects. It was found that 56.5% of students correctly understood that anti-inflammatory drugs are not antibiotics. Nevertheless, 43.5% still held this misconception, reflecting a gap in fundamental knowledge regarding drug classification. Regarding understanding of infections, only 34.5% of students were aware that viral diseases do not require antibiotics, while 63.0% had incorrect understanding. This represents a critical issue that may lead to inappropriate use of antibiotics.

In terms of medication-use behaviors, most students demonstrated appropriate practices. Specifically, 52.5% rarely or never purchased medications for self-use, and 66.0% rarely or never discontinued medications prematurely. However, some students still exhibited risky behaviors, such as frequently self-purchasing medications (16.0%) and occasionally discontinuing medications before completing the prescribed course (23.0%). Regarding sources of information, most students obtained information from pharmacists (97.0%) and physicians (94.5%), which can be considered a positive factor promoting appropriate medication use. However, some reliance on peers or family members (16.0%) and the internet (7.0%) was also observed, which may affect the accuracy of information. Additionally, most students used medications for symptomatic relief, such as headaches or muscle pain (83.5%), and commonly obtained medications from pharmacies (87.5%). Nonetheless, the use of medications from inappropriate sources was also identified, including leftover medications from previous treatments (19.0%) and medications from others (10.5%).

In the scenario-based assessment, most students made appropriate decisions, such as seeking medical attention when experiencing symptoms of the common cold (49.0%), completing the full course of antibiotics (83.5%), and consulting physicians or pharmacists when uncertain (83.0%). However, some students still chose to use antibiotics in cases of the common cold (15.5%) and severe sore throat (37.5%), which are considered inappropriate practices.

5. CONCLUSION

Secondary school students demonstrated a moderate level of knowledge and practices regarding medication use, with both appropriate and inappropriate behaviors observed. Most students exhibited appropriate practices, such as not self-purchasing medications, adhering to prescribed medication regimens, and consulting physicians or pharmacists. However, significant issues were identified, particularly misconceptions regarding the use of antibiotics, especially in viral infections, as well as inappropriate practices such as using leftover medications and sharing medications with others. Therefore, schools should promote proper knowledge of medication use among students. Educational interventions led by physicians and pharmacists should be implemented, with an emphasis on the differences between bacterial and viral infections and the rational use of antibiotics. These measures may help prevent inappropriate medication use and reduce the risk of antimicrobial resistance in the future.

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