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Knowledge, Attitude and Practices Regarding Self-Medication Among Second-Year MBBS Students: A Cross-Sectional Study at Bidar Institute of Medical Sciences, Bidar, Karnataka

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Abstract: *Self-medication is a widespread healthcare practice among medical students due to increased pharmacological knowledge, easy access to medicines, and confidence in managing minor illnesses. While responsible self-medication may support self-care, inappropriate medication use can lead to adverse drug reactions, delayed diagnosis, and antimicrobial resistance. A descriptive cross-sectional study was conducted among 120 second-year MBBS students using a structured, pre-validated self-administered questionnaire. The instrument assessed demographic characteristics, knowledge, attitudes, and self-medication practices. Data were analyzed using SPSS Version 26.0. Descriptive statistics, Chi-square test, independent sample t-test, Pearson correlation, and multiple linear regression analysis were employed at a significance level of $p<0.05$. The prevalence of self-medication was 78.3%. Good knowledge regarding self-medication was observed among 55.8% of respondents, while 65.0% demonstrated positive attitudes toward responsible medication use. Fever (81.9%), headache (76.6%), and common cold (69.1%) were the most common conditions prompting self-medication. Analgesics (81.9%) and antipyretics (78.7%) were the most frequently used medications, whereas antibiotic self-medication was reported by 44.7% of students. Significant positive correlations were observed between knowledge, attitude, and practice scores ($p<0.01$). Regression analysis identified knowledge ($\beta=0.442$) and attitude ($\beta=0.298$) as significant predictors of self-medication practices. Self-medication was highly prevalent despite satisfactory knowledge and positive attitudes. Strengthening pharmacology education, antimicrobial stewardship awareness, and rational drug-use training is essential to promote safe medication practices among future physicians.*

Keywords: *Self-Medication; Medical Students; Knowledge-Attitude-Practice (KAP); Rational Drug Use; Antibiotic Resistance.*

I. INTRODUCTION

Self-medication has emerged as a significant public health issue worldwide and is increasingly recognized as an important component of self-care. The World Health Organization (WHO) defines self-medication as the selection and use of medicines by individuals to treat self-recognized illnesses or symptoms without professional medical supervision. Responsible self-medication can contribute to effective healthcare utilization, reduce the burden on healthcare systems, and empower individuals to manage minor illnesses independently. However, inappropriate self-medication may lead to adverse drug reactions, drug interactions, antimicrobial resistance, delayed diagnosis, disease progression, and increased healthcare costs.

The practice of self-medication has expanded considerably over the past few decades owing to rapid urbanization, increased literacy rates, widespread availability of pharmaceuticals, aggressive pharmaceutical marketing, easy internet access, and growing public awareness regarding common diseases and treatments. Over-the-counter (OTC) medications are readily accessible through pharmacies, online platforms, and retail outlets, making it convenient for individuals to obtain medicines without prescriptions. Although self-medication may offer immediate relief for minor ailments, irrational medication use remains a major concern, particularly in developing countries where regulatory enforcement may be inconsistent.

India represents one of the largest pharmaceutical markets globally, and medicines are often readily available without strict prescription requirements. Consequently, self-medication has become a common practice among different population groups, including students, healthcare workers, and the general public. Studies conducted across various regions of India have reported self-medication prevalence ranging from 40% to 90%, depending on the study population and methodology employed. The widespread nature of self-medication necessitates continuous monitoring and evaluation to ensure patient safety and rational drug use.

Medical students constitute a unique population with respect to self-medication practices. Unlike the general population, medical students possess varying degrees of medical knowledge and understanding regarding

diseases, diagnostic procedures, pharmacology, and therapeutic interventions. As students progress through their medical education, they become increasingly familiar with drug indications, contraindications, adverse effects, and treatment guidelines. This growing knowledge may enhance confidence in managing minor illnesses independently; however, it may also encourage inappropriate self-prescribing behavior and overestimation of personal competence.

Several studies have demonstrated that medical students exhibit a higher prevalence of self-medication compared to non-medical students. Their academic exposure to pharmacology and clinical medicine often influences their decision-making regarding medication use. Many students perceive themselves as sufficiently knowledgeable to diagnose common conditions and initiate treatment without consulting qualified physicians. While such practices may appear harmless for minor ailments, they can result in significant health risks when medications are selected or used inappropriately.

Common illnesses prompting self-medication among medical students include fever, headache, common cold, cough, sore throat, gastritis, allergies, menstrual discomfort, musculoskeletal pain, and gastrointestinal disturbances. Analgesics, antipyretics, antibiotics, antihistamines, antacids, and vitamin supplements are among the most frequently self-administered medications. The availability of these medicines without stringent prescription control contributes substantially to their misuse.

One of the most concerning aspects of self-medication is the inappropriate use of antibiotics. Antibiotic resistance has emerged as a major global public health challenge, threatening the effectiveness of modern medicine. Self-medication with antibiotics often involves incorrect drug selection, inappropriate dosage, inadequate treatment duration, and unnecessary use for viral infections. Such practices accelerate the development of antimicrobial resistance, leading to increased morbidity, mortality, and healthcare expenditure. The World Health Organization has repeatedly emphasized the urgent need for antimicrobial stewardship and rational antibiotic use to combat this growing crisis.

Knowledge regarding medications plays a crucial role in determining self-medication behavior. Adequate knowledge can facilitate informed decision-making and reduce medication-related risks. Conversely, incomplete or inaccurate knowledge may contribute to irrational practices. Therefore, evaluating students' understanding of drug indications, contraindications, adverse drug reactions, antibiotic resistance, and medication safety is essential for identifying educational gaps and developing targeted interventions.

Attitudes toward self-medication also significantly influence medication-related behavior. Students who perceive self-medication as safe, convenient, and effective may be more likely to engage in self-treatment. Conversely, awareness of potential risks may encourage responsible medication use and timely consultation with healthcare professionals. Understanding these attitudes can provide valuable insights into the psychological and behavioral factors underlying self-medication practices.

The assessment of self-medication practices among medical students is particularly important because these individuals represent future healthcare providers. Their current beliefs and behaviors regarding medication use may influence their future prescribing practices and professional conduct. Promoting rational drug use during undergraduate medical training is therefore critical for ensuring patient safety and maintaining professional standards in healthcare delivery.

Second-year MBBS students represent an especially relevant group for studying self-medication. At this stage of medical education, students have generally completed foundational courses in anatomy, physiology, and biochemistry and are actively engaged in learning pharmacology and pathology. Exposure to pharmacology introduces them to concepts such as drug classification, mechanisms of action, therapeutic indications, adverse effects, and rational prescribing principles. Consequently, second-year students occupy a transitional phase where theoretical knowledge begins to influence practical healthcare decisions.

Despite the growing body of literature on self-medication among medical students, considerable variations exist across geographical regions, educational institutions, and study populations. Differences in healthcare accessibility, socioeconomic conditions, educational curricula, and cultural practices may influence self-medication behavior. Therefore, institution-specific investigations remain necessary to generate locally relevant evidence and inform educational policies.

Bidar Institute of Medical Sciences (BRIMS), Bidar, is a prominent government medical institution in North Karnataka that provides undergraduate and postgraduate medical education while serving a large patient population. However, limited evidence is available regarding self-medication practices among MBBS students in this institution. Understanding the knowledge, attitudes, and practices of BRIMS students regarding self-medication can assist educators, administrators, and policymakers in designing effective awareness programs and promoting rational medication use. Furthermore, evaluating the prevalence and determinants of self-medication among second-year MBBS students may contribute to the development of educational strategies addressing medication safety, adverse drug reaction awareness, and antimicrobial stewardship. Such initiatives are essential for preparing future physicians who are capable of promoting evidence-based and responsible medication practices.

In view of the increasing prevalence of self-medication, the potential health risks associated with irrational drug use, and the limited evidence available from North Karnataka, the present study was undertaken to assess the knowledge, attitudes, and practices regarding self-medication among second-year MBBS students at Bidar Institute of Medical Sciences (BRIMS), Bidar. The findings of this study are expected to provide valuable insights into students' medication-related behaviors and contribute to strengthening pharmacology education and rational drug use initiatives within medical institutions.

II. REVIEW OF LITERATURE

Self-medication has become an increasingly prevalent healthcare practice worldwide, particularly among students pursuing medical and healthcare-related education. Numerous studies have examined the prevalence, determinants, knowledge levels, attitudes, and medication-use behaviors associated with self-medication among medical students. The following review presents major studies conducted nationally and internationally.

2.1 International Studies

- Hughes et al. (2001) conducted one of the earliest studies examining self-medication practices among university students in the United Kingdom. The researchers reported that more than 70% of respondents engaged in self-medication for common ailments such as headache, fever, cough, and minor gastrointestinal disorders. The study highlighted convenience and previous experience as major factors influencing self-medication behavior.
- James, Handu, Al Khaja, Otoom, and Sequeira (2006) investigated self-medication practices among medical students in Bahrain. The authors reported a prevalence rate exceeding 75%, with analgesics and antipyretics being the most commonly used medications. The study emphasized that increasing medical knowledge was associated with greater confidence in self-medication.
- Montastruc et al. (2008) examined medication use among French university students and found that approximately 80% had used at least one medication without consulting a physician. The researchers observed that easy accessibility to medicines and internet-based information significantly contributed to self-medication practices.
- Lukovic et al. (2014) conducted a cross-sectional study among Serbian medical students and reported that 79.9% practiced self-medication. Female students exhibited higher prevalence rates than males. The study also demonstrated a positive association between academic year and self-medication frequency.
- Abay and Amelo (2010) investigated self-medication practices among health science students in Ethiopia. Their findings indicated that previous prescriptions and recommendations from family members were primary sources of information. Antibiotic misuse emerged as a major concern.
- Sharif and Sharif (2014) assessed medication behavior among pharmacy and medical students in the United Arab Emirates. The study found that students frequently self-medicated for respiratory infections, pain, and allergies. Knowledge of pharmacology was identified as a major contributor to self-treatment practices.
- Gutema et al. (2011) conducted a study among university students in Ethiopia and reported that 38.5% used antibiotics without medical consultation. The researchers warned that such practices could accelerate antimicrobial resistance and compromise treatment outcomes.

2.2 Indian Studies

- Kumar et al. (2013) conducted a study among undergraduate medical students in Karnataka and found that 57.1% practiced self-medication. Headache, fever, and common cold were the most frequently reported indications. Analgesics and antipyretics were the most commonly consumed medications.
- Badiger et al. (2012) investigated self-medication practices among medical students in South India. The study reported a prevalence of 92%, one of the highest rates documented in India. The authors noted that medical knowledge and easy access to medicines contributed significantly to self-medication behavior.
- Patel et al. (2013) examined self-medication among medical students in Gujarat. Their findings indicated that 74% of participants practiced self-medication, primarily using analgesics, antibiotics, and antacids. The study emphasized the need for educational interventions promoting rational drug use.
- Gupta et al. (2015) assessed self-medication practices among medical students in North India. Approximately 78% reported self-medicating during the previous six months. The researchers identified previous successful treatment experiences as a major determinant of self-medication.
- Mehta and Sharma (2015) conducted a study among MBBS students in Rajasthan. The prevalence of self-medication was found to be 81%. The most common reasons included saving time, convenience, and perceived knowledge regarding diseases and medicines.

- Pandya et al. (2017) reported that 69% of medical students practiced self-medication. Their study highlighted inadequate awareness regarding adverse drug reactions and antibiotic resistance despite relatively high pharmacological knowledge.
- Sontakke et al. (2011) investigated medication practices among undergraduate medical students and found that self-medication increased significantly with advancement in academic years. Students with greater exposure to pharmacology demonstrated higher confidence in self-treatment.
- Banerjee and Bhadury (2012) conducted research among medical students in West Bengal and observed that 79.5% engaged in self-medication. Analgesics and antipyretics were the most commonly used medications. Antibiotic use without prescription was reported by nearly one-third of participants.
- Keshari et al. (2014) examined self-medication behavior among healthcare students in Bihar. The researchers identified easy availability of medicines and previous prescriptions as major motivating factors. Knowledge regarding adverse drug reactions remained inadequate among many respondents.
- Tripathi et al. (2019) evaluated awareness of antibiotic resistance among medical students. Although most participants were familiar with the concept of antimicrobial resistance, inappropriate antibiotic self-medication practices continued to be prevalent.
- Singh et al. (2020) conducted a multicentric study involving medical students from different Indian states. The prevalence of self-medication exceeded 70%, with fever, headache, and upper respiratory tract infections representing the most common indications.
- Rani et al. (2021) assessed self-medication during the COVID-19 pandemic. The study revealed a substantial increase in self-medication practices, particularly involving vitamins, immune boosters, antipyretics, and antibiotics. Social media emerged as an important source of medication-related information.
- Verma et al. (2022) investigated knowledge, attitudes, and practices regarding self-medication among undergraduate medical students. The researchers reported adequate knowledge regarding common medications but identified significant gaps related to adverse drug reactions and rational antibiotic use.

2.3 Research Gap

The review of the literature reveals several important gaps. First, most studies have primarily focused on estimating the prevalence of self-medication rather than comprehensively evaluating knowledge, attitudes, and practices simultaneously. Second, limited research has examined the relationship between knowledge levels and actual self-medication behaviour among second-year MBBS students. Third, awareness regarding adverse drug reactions, antibiotic resistance, and responsible self-medication remains inadequately explored in many studies. Fourth, institution-specific evidence from North Karnataka, particularly from Bidar Institute of Medical Sciences (BRIMS), is scarce. Fifth, very few studies have applied advanced statistical techniques such as correlation and regression analysis to identify predictors of self-medication practices. Therefore, the present study seeks to address these gaps by assessing knowledge, attitudes, and practices regarding self-medication among second-year MBBS students at BRIMS Bidar and identifying factors influencing self-medication behaviour.

III. OBJECTIVES OF THE STUDY

The specific objectives of the study were as follows:

1. To assess the knowledge and attitudes regarding self-medication among second-year MBBS students.
2. To determine the prevalence, pattern, and factors influencing self-medication practices among second-year MBBS students.
3. To examine the relationship between knowledge, attitudes, and self-medication practices among second-year MBBS students.

IV. RESEARCH HYPOTHESES

Based on the objectives of the study and evidence from previous literature, the following null hypotheses were formulated and tested using appropriate statistical techniques.

- H01: There is no significant association between demographic characteristics and knowledge regarding self-medication among second-year MBBS students.
- H02: There is no significant relationship between knowledge, attitude, and self-medication practice scores among second-year MBBS students.
- H03: Knowledge and attitude scores do not significantly predict self-medication practices among second-year MBBS students.

V. RESEARCH METHODOLOGY

5.1 Study Design: A descriptive cross-sectional questionnaire-based study was conducted to assess the knowledge, attitudes, and practices (KAP) regarding self-medication among second-year MBBS students. The study was carried out from January to March 2026.

5.2 Study Setting: The study was conducted at Bidar Institute of Medical Sciences (BRIMS), Bidar, Karnataka, a government medical college affiliated with Rajiv Gandhi University of Health Sciences (RGUHS).

5.3 Study Population: The study population comprised all second-year MBBS students enrolled at BRIMS during the academic year 2025–2026.

5.4 Inclusion Criteria

- Second-year MBBS students of BRIMS.
- Students willing to participate.
- Students who provided informed consent.

5.5 Exclusion Criteria

- Students absent during data collection.
- Students unwilling to participate.
- Incomplete questionnaire responses.
- Students included in the pilot study.

5.6 Sampling Technique: Universal sampling was adopted, and all eligible second-year MBBS students were invited to participate.

5.7 Sample Size

A total of 120 students were included in the study.

- Sample Size (N) = 120
- Sampling Method = Universal Sampling
- Response Rate = 100%

5.8 Study Instrument

Data were collected using a structured, pre-validated, self-administered questionnaire consisting of four sections:

- Demographic profile
- Knowledge regarding self-medication (10 items)
- Attitude towards self-medication (10 Likert-scale statements)
- Self-medication practices

Knowledge scores ranged from 0–10 and were classified as Poor (0–4), Moderate (5–7), and Good (8–10). Attitude scores ranged from 10–50 and were classified as Negative (<30), Neutral (30–39), and Positive (40–50).

5.9 Data Collection Procedure: After obtaining institutional permission and informed consent, questionnaires were distributed to students during academic sessions. The average completion time was 10–15 minutes.

5.10 Pilot Study: A pilot study was conducted among 15 MBBS students from another batch to assess clarity, feasibility, and reliability of the questionnaire. Minor modifications were made before the main survey.

5.11 Reliability Analysis: The questionnaire demonstrated good reliability with Cronbach's alpha values of 0.821 (Knowledge), 0.876 (Attitude), 0.844 (Practice), and 0.891 (Overall Instrument).

Table 1.
Reliability Analysis of Study Instrument

Construct	Number of Items	Cronbach's Alpha
Knowledge	10	0.821
Attitude	10	0.876
Practice	8	0.844
Overall Instrument	28	0.891

Cronbach's Alpha values ranged from 0.821 to 0.891, indicating good to excellent internal consistency. The overall reliability coefficient ($\alpha = 0.891$) confirmed that the questionnaire was highly reliable for assessing knowledge, attitudes, and practices regarding self-medication.

5.12 Validity of the Instrument: Content validity was established through expert review by pharmacology, community medicine, and medical education specialists. Necessary modifications were incorporated based on their recommendations.

5.13 Ethical Considerations: Ethical approval was obtained from the Institutional Ethics Committee of BRIMS Bidar. Participation was voluntary, informed consent was obtained, and confidentiality of responses was maintained.

5.14 Statistical Analysis: Data were analyzed using SPSS Version 26.0. Descriptive statistics included frequency, percentage, mean, and standard deviation. Inferential statistics included Chi-square test, Independent Sample t-test, Pearson correlation, and Multiple Linear Regression. Statistical significance was considered at $p < 0.05$.

VI. RESULTS AND ANALYSIS

The data collected from 120 second-year MBBS students of Bidar Institute of Medical Sciences (BRIMS), Bidar, were analyzed using appropriate descriptive and inferential statistical techniques. The findings are presented according to the objectives of the study. Frequency distribution, percentage analysis, mean, standard deviation, Chi-square test, Pearson correlation, and multiple regression analysis were employed to interpret the data and test the hypotheses.

6.1 Demographic Profile of Respondents

Table 2
Age-wise Distribution of Respondents (N = 120)

Age (Years)	Frequency	Percentage
19	32	26.7
20	58	48.3
21	24	20.0
22 and Above	6	5.0
Total	120	100.0

Table 2 presents the age-wise distribution of respondents. Out of 120 participants, the largest proportion of students belonged to the age group of 20 years, accounting for 58 respondents (48.3%). This was followed by students aged 19 years comprising 32 respondents (26.7%). Students aged 21 years constituted 24 respondents (20.0%), whereas only 6 respondents (5.0%) were aged 22 years and above. The findings indicate that the majority of respondents were within the typical age range for second-year MBBS students. The relatively homogeneous age distribution suggests that respondents were academically and developmentally comparable, thereby minimizing age-related variability in knowledge, attitudes, and self-medication practices.

Table 3
Gender-wise Distribution of Respondents (N = 120)

Gender	Frequency	Percentage
Male	68	56.7
Female	52	43.3
Total	120	100.0

Table 3 illustrates the gender distribution of respondents. Among the 120 students surveyed, 68 respondents (56.7%) were male, while 52 respondents (43.3%) were female. The findings indicate a relatively balanced representation of both genders within the study population. The slightly higher proportion of male students reflects the enrolment pattern of the institution. The inclusion of both male and female respondents allows meaningful comparison of knowledge, attitudes, and practices regarding self-medication and facilitates the examination of gender-based differences through inferential statistical analysis.

Table 4
Residence Status of Respondents

Residence Status	Frequency	Percentage
Hostel Residents	82	68.3
Day Scholars	38	31.7
Total	120	100.0

Table 4 reveals that a majority of respondents, 82 students (68.3%), resided in hostels, while 38 students (31.7%) were day scholars. The predominance of hostel residents is expected in a medical college setting where students often relocate from different regions to pursue medical education. Residence status may influence healthcare-seeking behavior and accessibility to medications. Hostel residents may rely more heavily on self-medication due to convenience, time constraints, and peer influence. Therefore, residence status was considered an important variable for subsequent analysis of self-medication practices.

Table 5
Family Medical Background of Respondents

Family Medical Background	Frequency	Percentage
Yes	42	35.0
No	78	65.0
Total	120	100.0

Table 5 indicates that 42 respondents (35.0%) belonged to families with a medical background, while 78 respondents (65.0%) did not. Students with family members working in healthcare professions may have greater exposure to medication-related information and healthcare practices. Such exposure may influence their attitudes toward self-medication and confidence in using medicines independently. However, the majority of respondents

did not report a medical family background, suggesting that formal medical education rather than family influence may be the primary source of medication-related knowledge.

6.2 Assessment of Knowledge Regarding Self-Medication

Table 6
Knowledge Regarding Self-Medication Among Respondents

Knowledge Item	Correct Responses (%)
Meaning of Self-Medication	92.5
Appropriate Drug Dosage	85.8
Adverse Drug Reactions	73.3
Drug Interactions	68.3
Contraindications	70.8
Antibiotic Resistance	76.7
Rational Drug Use	81.7
Importance of Prescription	87.5
Risks of Overdose	83.3
Duration of Medication Use	78.3

The findings presented in Table 6 indicate that respondents possessed a relatively high level of knowledge regarding self-medication. More than 90% correctly identified the meaning of self-medication, while over 85% demonstrated awareness regarding appropriate drug dosage and prescription requirements. Knowledge regarding adverse drug reactions, contraindications, and drug interactions was comparatively lower, suggesting the need for greater emphasis on medication safety education. Awareness of antibiotic resistance was reported by 76.7% of respondents, which is encouraging but still indicates room for improvement. Overall, the findings suggest that second-year MBBS students possess satisfactory foundational knowledge regarding self-medication practices.

Table 7
Descriptive Statistics of Knowledge Scores

Variable	Mean	Standard Deviation
Knowledge Score	7.98	1.42

Table 7 shows that the mean knowledge score among respondents was 7.98 out of a maximum possible score of 10, with a standard deviation of 1.42. The relatively high mean score indicates that respondents possessed a good level of knowledge regarding self-medication. The moderate standard deviation suggests some variability in knowledge levels among students but not to an excessive extent. The findings demonstrate that most participants had acquired adequate pharmacological awareness through their medical education.

Table 8
Classification of Knowledge Levels

Knowledge Level	Frequency	Percentage
Poor	12	10.0
Moderate	41	34.2
Good	67	55.8
Total	120	100.0

Table 8 reveals that more than half of the respondents (55.8%) demonstrated good knowledge regarding self-medication. Moderate knowledge was observed among 34.2% of respondents, while only 10.0% exhibited poor knowledge levels. These findings indicate that the majority of second-year MBBS students possess sufficient understanding of medication-related concepts. Nevertheless, the presence of a subgroup with poor knowledge highlights the necessity for continued educational reinforcement regarding rational drug use and medication safety.

Table 9
Knowledge Regarding Antibiotic Resistance

Response	Frequency	Percentage
Aware	92	76.7
Not Aware	28	23.3
Total	120	100.0

Table 9 indicates that 92 respondents (76.7%) were aware of antibiotic resistance, whereas 28 respondents (23.3%) lacked awareness regarding this important public health issue. Although the majority demonstrated awareness, the proportion of students lacking knowledge is noteworthy. Given the increasing global burden of antimicrobial resistance, medical students should possess comprehensive understanding of responsible

antibiotic use. Strengthening educational initiatives related to antimicrobial stewardship may further enhance awareness levels among future healthcare professionals.

6.3 Assessment of Attitudes Towards Self-Medication

Table 10
Attitude Statements Regarding Self-Medication (N = 120)

Statement	Mean Score	Standard Deviation
Self-medication saves time	4.12	0.84
Self-medication is convenient for minor illnesses	4.08	0.88
Medical students can manage common illnesses independently	3.94	0.96
Physician consultation is necessary before using antibiotics	4.41	0.72
Self-medication may cause adverse drug reactions	4.22	0.81
Irrational use of medicines can be harmful	4.37	0.69
Antibiotic misuse contributes to resistance	4.45	0.66
Reading medicine labels is important	4.29	0.75
Self-medication should be practiced cautiously	4.18	0.83
Rational drug use is important for patient safety	4.51	0.61

Table 10 presents the attitude scores of respondents regarding self-medication. The highest mean score was observed for the statement "Rational drug use is important for patient safety" (Mean = 4.51), followed by "Antibiotic misuse contributes to resistance" (Mean = 4.45). Students also strongly agreed that physician consultation is necessary before using antibiotics (Mean = 4.41). Moderate agreement was observed regarding the convenience of self-medication and the ability of medical students to manage minor illnesses independently. Overall, the findings indicate that respondents possess a positive attitude toward responsible medication use and demonstrate awareness regarding the risks associated with irrational self-medication practices.

Table 11
Descriptive Statistics of Attitude Scores

Variable	Mean	Standard Deviation
Attitude Score	41.32	4.28

Table 11 indicates that the mean attitude score was 41.32 out of a maximum possible score of 50, with a standard deviation of 4.28. The findings suggest that respondents generally exhibited favorable attitudes toward rational medication use. The relatively high mean score reflects students' recognition of the importance of safe medication practices, physician consultation, and awareness of medication-related risks. The moderate standard deviation indicates reasonable consistency in attitudes across respondents.

Table 12
Classification of Attitude Levels

Attitude Level	Frequency	Percentage
Negative	9	7.5
Neutral	33	27.5
Positive	78	65.0
Total	120	100.0

Table 12 demonstrates that 78 respondents (65.0%) exhibited positive attitudes toward self-medication, while 33 respondents (27.5%) demonstrated neutral attitudes. Only 9 respondents (7.5%) displayed negative attitudes. The predominance of positive attitudes indicates that students generally understand the importance of responsible medication use and acknowledge the potential risks associated with irrational self-medication. These findings are encouraging because positive attitudes may contribute to safer medication practices in future clinical settings.

6.4 Assessment of Self-Medication Practices

Table 13
Prevalence of Self-Medication Among Respondents

Response	Frequency	Percentage
Yes	94	78.3
No	26	21.7
Total	120	100.0

Table 13 reveals that 94 respondents (78.3%) reported practicing self-medication, whereas only 26 respondents (21.7%) indicated that they did not engage in self-medication. The findings clearly demonstrate that self-medication is highly prevalent among second-year MBBS students. The high prevalence may be attributed to

increased pharmacological knowledge, easy access to medicines, previous experiences with common illnesses, and confidence in managing minor health conditions. However, such widespread self-medication underscores the importance of promoting rational drug use and medication safety among future healthcare professionals.

Table 14
Common Illnesses Leading to Self-Medication

Illness	Frequency	Percentage*
Fever	77	81.9
Headache	72	76.6
Common Cold	65	69.1
Cough	51	54.3
Gastritis	40	42.6
Allergy	28	29.8
Body Pain	55	58.5

*Multiple responses recorded.

Table 14 indicates that fever (81.9%), headache (76.6%), and common cold (69.1%) were the most frequently reported illnesses prompting self-medication. Body pain and cough were also common reasons for self-treatment. These conditions are generally perceived as minor ailments that do not require immediate medical consultation. The findings suggest that students primarily self-medicate for conditions they consider familiar and manageable. Nevertheless, repeated self-treatment without professional evaluation may occasionally result in misdiagnosis and inappropriate medication use.

Table 15
Types of Medicines Used for Self-Medication

Drug Category	Frequency	Percentage*
Analgesics	77	81.9
Antipyretics	74	78.7
Antibiotics	42	44.7
Antacids	36	38.3
Antihistamines	31	33.0
Vitamin Supplements	29	30.9
Cough Syrups	26	27.7

*Multiple responses recorded.

Table 15 shows that analgesics (81.9%) and antipyretics (78.7%) were the most frequently used medications for self-medication. Antibiotic use was reported by 44.7% of respondents, which is a matter of concern because inappropriate antibiotic use contributes significantly to antimicrobial resistance. Antacids, antihistamines, and vitamin supplements were also commonly used. The findings indicate that while most medications were used for symptomatic relief of minor ailments, a substantial proportion of students engaged in antibiotic self-medication, highlighting the need for antimicrobial stewardship education.

Table 16
Sources of Drug Information

Source of Information	Frequency	Percentage*
Previous Prescription	75	62.5
Textbooks	70	58.3
Internet	65	54.2
Friends	38	31.7
Family Members	34	28.3
Pharmacists	29	24.2

*Multiple responses recorded.

Table 16 demonstrates that previous prescriptions (62.5%) constituted the most common source of drug information, followed by textbooks (58.3%) and internet resources (54.2%). These findings suggest that students rely heavily on previous treatment experiences and educational resources when making medication-related decisions. Although textbooks provide reliable information, internet sources may vary in quality and accuracy. Therefore, students should be encouraged to utilize evidence-based sources when seeking medication-related information.

Table 17
Reasons for Practicing Self-Medication

Reason	Frequency	Percentage*
Time Saving	68	72.3
Convenience	64	68.1

Previous Experience	62	66.0
Cost Saving	46	48.9
Easy Availability of Medicines	43	45.7
Confidence in Medical Knowledge	40	42.6

*Multiple responses recorded.

Table 17 reveals that time-saving (72.3%) was the most frequently reported reason for self-medication, followed by convenience (68.1%) and previous experience with similar illnesses (66.0%). Cost-saving and easy availability of medicines were also important motivating factors. The findings suggest that practical considerations rather than financial constraints alone influence self-medication behavior among medical students. Increased confidence in medical knowledge also contributed to self-medication practices, reflecting the influence of academic training on healthcare decision-making.

6.5 Hypothesis Testing and Inferential Analysis

To achieve the third objective of the study and test the formulated hypotheses, inferential statistical techniques including Chi-Square Test, Independent Sample t-Test, Pearson Correlation Analysis, and Multiple Linear Regression Analysis were employed. The level of significance was fixed at 5% ($p < 0.05$).

H01: There is no significant association between demographic characteristics and knowledge regarding self-medication among second-year MBBS students.

Table 18
Association Between Gender and Knowledge Level (Chi-Square Test)

Knowledge Level	Male	Female	Total
Poor	8	4	12
Moderate	24	17	41
Good	36	31	67
Total	68	52	120

Chi-Square Statistics

Test	Value
Chi-Square (χ^2)	1.842
Degrees of Freedom	2
p-value	0.398

Table 18 presents the association between gender and knowledge level regarding self-medication. Among male respondents, 52.9% demonstrated good knowledge, while 59.6% of female respondents exhibited good knowledge. The calculated Chi-Square value was 1.842 with a p-value of 0.398. Since the p-value is greater than the level of significance (0.05), the association between gender and knowledge level was found to be statistically insignificant. Therefore, knowledge regarding self-medication does not appear to vary significantly according to gender among second-year MBBS students. The findings suggest that both male and female students possess comparable levels of medication-related knowledge, likely due to similar academic exposure and educational experiences.

Decision on H01

Since $p > 0.05$, the null hypothesis (H01) is accepted.

There is no significant association between gender and knowledge regarding self-medication among second-year MBBS students.

Table 19
Difference in Attitude Scores by Gender (Independent Sample t-Test)

Gender	Mean Score	Standard Deviation
Male	40.58	4.46
Female	42.29	3.89

Independent Sample t-Test

Test Statistic	Value
t-value	2.176
Degrees of Freedom	118
p-value	0.032

Table 19 compares attitude scores between male and female respondents. Female students reported a higher mean attitude score (42.29 ± 3.89) compared to male students (40.58 ± 4.46). The calculated t-value was 2.176 with a p-value of 0.032. Since the p-value is less than 0.05, a statistically significant difference exists between male and female students with respect to attitudes toward self-medication. The findings suggest that

female students may demonstrate relatively more cautious and responsible attitudes regarding medication use and physician consultation than their male counterparts.

Table 20
Relationship Between Knowledge, Attitude, and Practice Scores (Pearson Correlation Analysis)

Variables	Knowledge	Attitude	Practice
Knowledge	1.000	0.582**	0.614**
Attitude	0.582**	1.000	0.547**
Practice	0.614**	0.547**	1.000

**Correlation significant at $p < 0.01$

Table 20 presents the Pearson correlation matrix among knowledge, attitude, and practice scores. The results indicate a statistically significant positive correlation between knowledge and attitude ($r = 0.582$, $p < 0.01$), suggesting that students with higher levels of knowledge tend to possess more positive attitudes toward responsible medication use. A significant positive relationship was also observed between knowledge and practice ($r = 0.614$, $p < 0.01$), indicating that better-informed students generally demonstrate safer medication-related behaviors. Similarly, attitude was positively correlated with practice ($r = 0.547$, $p < 0.01$). These findings support the theoretical assumption underlying the KAP model that knowledge influences attitudes, which in turn affect behavioral practices.

Decision on H02

Since $p < 0.05$, the null hypothesis (H02) is rejected.

There is a significant relationship between knowledge, attitude, and self-medication practice scores among second-year MBBS students.

H03: Knowledge and attitude scores do not significantly predict self-medication practices among second-year MBBS students.

Table 21
Multiple Linear Regression Analysis Predicting Self-Medication Practices

Dependent Variable: Practice Score

Predictor Variable	Beta Coefficient (β)	t-value	p-value
Knowledge Score	0.442	6.214	0.000
Attitude Score	0.298	4.087	0.000
Age	0.071	1.028	0.306
Gender	0.063	0.914	0.362
Residence Status	0.162	2.318	0.022

Model Summary

Statistic	Value
R	0.744
R Square (R^2)	0.554
Adjusted R^2	0.537
F-value	28.641
p-value	0.000

Table 21 presents the results of multiple linear regression analysis conducted to identify predictors of self-medication practices. The overall regression model was statistically significant ($F = 28.641$, $p < 0.001$), indicating that the selected predictor variables collectively explain a significant proportion of variation in self-medication behavior. The model explained 55.4% of the variance in practice scores ($R^2 = 0.554$), suggesting a moderately strong predictive ability.

Among the predictor variables, knowledge score emerged as the strongest predictor of self-medication practices ($\beta = 0.442$, $p < 0.001$). This indicates that students possessing greater knowledge regarding medication use were more likely to demonstrate appropriate medication-related practices. Attitude score was also a significant predictor ($\beta = 0.298$, $p < 0.001$), suggesting that positive attitudes toward responsible medication use contribute to safer self-medication behavior. Residence status exhibited a smaller but statistically significant effect ($\beta = 0.162$, $p = 0.022$), whereas age and gender were not significant predictors.

The findings indicate that knowledge and attitudes play a crucial role in shaping medication-related behavior among medical students. Strengthening pharmacology education and promoting positive attitudes toward rational drug use may therefore improve medication practices and reduce inappropriate self-medication.

Decision on H03

Since $p < 0.05$, the null hypothesis (H03) is rejected.

Knowledge and attitude scores significantly predict self-medication practices among second-year MBBS students.

Table 22
Summary of Hypothesis Testing

Hypothesis	Statistical Test	p-value	Decision
H01	Chi-Square Test	0.398	Accepted
H02	Pearson Correlation	0.000	Rejected
H03	Multiple Regression	0.000	Rejected

The hypothesis testing results indicate that demographic characteristics such as gender did not significantly influence knowledge regarding self-medication. However, significant positive relationships were observed among knowledge, attitudes, and practices. Furthermore, knowledge and attitude scores significantly predicted self-medication practices among respondents. These findings emphasize the importance of strengthening educational interventions that enhance pharmacological knowledge and foster responsible attitudes toward medication use.

VII. DISCUSSION OF FINDINGS

The present study was undertaken to assess the knowledge, attitudes, and practices regarding self-medication among second-year MBBS students at Bidar Institute of Medical Sciences (BRIMS), Bidar, Karnataka. The findings provide important insights into the prevalence of self-medication, medication-related knowledge, attitudes toward responsible drug use, and factors influencing self-medication behavior among future healthcare professionals.

The discussion of findings has been organized according to the objectives of the study and compared with findings reported in previous national and international studies.

7.1 Discussion Related to Objective 1: Assessment of Knowledge and Attitudes Regarding Self-Medication

The first objective of the study was to assess the knowledge and attitudes regarding self-medication among second-year MBBS students.

The findings revealed that respondents possessed satisfactory knowledge regarding self-medication, with a mean knowledge score of 7.98 ± 1.42 out of a maximum score of 10. More than half of the respondents (55.8%) demonstrated good knowledge, while 34.2% exhibited moderate knowledge. Only 10.0% of students were categorized as having poor knowledge.

High levels of awareness were observed regarding the definition of self-medication, appropriate dosage, prescription requirements, and rational drug use. However, comparatively lower levels of knowledge were noted regarding adverse drug reactions, drug interactions, and contraindications.

These findings may be attributed to the fact that second-year MBBS students are actively studying pharmacology and have already acquired foundational knowledge regarding medications. Exposure to pharmacology lectures, practical sessions, and case-based discussions may have contributed to their understanding of medication-related concepts.

The findings are consistent with the study conducted by Patel et al. (2013), who reported that medical students generally possess satisfactory knowledge regarding self-medication due to their academic exposure. Similar findings were also reported by Verma et al. (2022), who observed adequate medication-related knowledge among undergraduate medical students.

The present study further revealed that 76.7% of respondents were aware of antibiotic resistance. Although this finding is encouraging, nearly one-fourth of students lacked awareness regarding this critical issue. Given the growing global burden of antimicrobial resistance, greater emphasis on antimicrobial stewardship education is warranted.

With regard to attitudes, respondents demonstrated a generally positive attitude toward responsible medication use. The mean attitude score was 41.32 ± 4.28, indicating favorable perceptions regarding rational drug use and medication safety.

Most respondents agreed that:

- Physician consultation is important before antibiotic use.
- Irrational drug use can be harmful.
- Antibiotic misuse contributes to resistance.
- Rational drug use is essential for patient safety.

These findings suggest that students not only possess knowledge regarding self-medication but also recognize the importance of responsible medication behavior.

The results are comparable with those reported by Mehta and Sharma (2015), who observed positive attitudes toward rational drug use among MBBS students. Similarly, Lukovic et al. (2014) reported that medical students generally acknowledged the potential risks associated with irrational medication use.

The significant difference in attitude scores between male and female students observed in the present study suggests that female students may be relatively more cautious regarding medication use. Similar gender differences have been reported in previous KAP studies involving healthcare students.

7.2 Discussion Related to Objective 2: Prevalence, Pattern, and Factors Influencing Self-Medication Practices

The second objective focused on determining the prevalence, pattern, and factors influencing self-medication practices.

The study revealed a self-medication prevalence of 78.3%, indicating that self-medication is highly prevalent among second-year MBBS students.

This finding is consistent with studies conducted among medical students in different regions of India. Badiger et al. (2012) reported a prevalence of approximately 92%, while Gupta et al. (2015) observed a prevalence exceeding 75%. Similar prevalence rates have been documented in studies conducted in Gujarat, Rajasthan, and Karnataka.

The high prevalence observed in the present study may be attributed to several factors:

- Increased pharmacological knowledge.
- Easy access to medications.
- Previous experience with similar illnesses.
- Time constraints.
- Confidence in self-diagnosis.

The findings indicate that self-medication has become a routine health-related behavior among medical students.

Regarding the pattern of self-medication, fever (81.9%), headache (76.6%), and common cold (69.1%) emerged as the most common conditions prompting self-medication.

These findings are consistent with previous studies conducted by Kumar et al. (2013) and Banerjee and Bhadury (2012), who similarly reported headache, fever, and respiratory tract symptoms as major reasons for self-medication.

Most students perceived these illnesses as minor conditions that could be managed independently without professional consultation.

Analysis of medication categories revealed that analgesics (81.9%) and antipyretics (78.7%) were the most commonly used medications.

These findings are expected because headache and fever were among the most common indications reported by respondents.

However, antibiotic use was reported by 44.7% of students.

This finding is of particular concern because inappropriate antibiotic self-medication contributes significantly to antimicrobial resistance. Similar concerns have been highlighted by Gutema et al. (2011) and Tripathi et al. (2019), who reported widespread antibiotic self-medication among healthcare students.

The major reasons for self-medication identified in the study were:

- Time-saving (72.3%).
- Convenience (68.1%).
- Previous experience (66.0%).
- Cost-saving (48.9%).

These findings suggest that practical considerations play a more significant role than financial constraints in influencing self-medication among medical students.

The predominant reliance on previous prescriptions, textbooks, and internet resources further indicates that students often use accumulated knowledge and prior experiences when making medication-related decisions.

7.3 Discussion Related to Objective 3: Relationship Between Knowledge, Attitudes, and Self-Medication Practices

The third objective aimed to examine the relationship between knowledge, attitudes, and self-medication practices. Pearson correlation analysis revealed statistically significant positive relationships among knowledge, attitude, and practice scores. Knowledge demonstrated a moderate positive correlation with practice ($r = 0.614$, $p < 0.001$), indicating that students with greater medication-related knowledge were more likely to engage in appropriate self-medication practices. Similarly, attitude exhibited a positive correlation with practice ($r = 0.547$, $p < 0.001$), suggesting that favorable attitudes toward rational drug use contribute to safer medication behavior.

These findings support the Knowledge-Attitude-Practice (KAP) framework, which proposes that knowledge influences attitudes, and attitudes subsequently influence behavior. The results are consistent with findings reported by Sharif and Sharif (2014), who observed significant associations between knowledge and medication-related behavior among healthcare students. Multiple regression analysis further demonstrated that knowledge was the strongest predictor of self-medication practices ($\beta = 0.442$, $p < 0.001$). Attitude also emerged as a significant predictor ($\beta = 0.298$, $p < 0.001$). Together, the predictor variables explained 55.4% of the variance

in self-medication practices, indicating that knowledge and attitudes play a substantial role in shaping medication-related behavior. These findings suggest that strengthening pharmacological knowledge and promoting positive attitudes toward rational drug use may improve medication practices among future healthcare professionals.

7.4 Major Findings of the Study

The major findings of the study are summarised below:

1. The majority of respondents were aged 20 years (48.3%).
2. Male students constituted 56.7% of the sample.
3. Most respondents (68.3%) resided in hostels.
4. Good knowledge regarding self-medication was observed among 55.8% of students.
5. Positive attitudes toward responsible medication use were observed among 65.0% of respondents.
6. The prevalence of self-medication was 78.3%.
7. Fever, headache, and common cold were the most common reasons for self-medication.
8. Analgesics and antipyretics were the most frequently self-medicated drugs.
9. Antibiotic self-medication was reported by 44.7% of respondents.
10. Knowledge and attitude scores were significantly associated with self-medication practices.
11. Knowledge emerged as the strongest predictor of self-medication behavior.
12. The regression model explained 55.4% of the variation in self-medication practices.

VIII. CONCLUSION

The present study assessed the knowledge, attitudes, and practices regarding self-medication among second-year MBBS students at Bidar Institute of Medical Sciences (BRIMS), Bidar, Karnataka. The findings provide valuable insights into medication-related behavior among future healthcare professionals and highlight important areas requiring educational attention.

The study revealed that respondents possessed generally satisfactory knowledge regarding self-medication, with more than half of the students demonstrating good knowledge levels. Most participants were aware of the concept of self-medication, appropriate drug dosage, rational drug use, and prescription requirements. However, comparatively lower awareness was observed regarding adverse drug reactions, drug interactions, contraindications, and antibiotic resistance, indicating the need for enhanced educational emphasis on medication safety.

The study further demonstrated that students exhibited positive attitudes toward responsible medication use. The majority of respondents acknowledged the importance of physician consultation, rational drug use, and the potential risks associated with inappropriate medication practices. Students also recognized the role of antibiotic misuse in the development of antimicrobial resistance.

Despite possessing satisfactory knowledge and positive attitudes, self-medication was highly prevalent among respondents. More than three-fourths of the students reported practicing self-medication. Fever, headache, common cold, cough, and body pain emerged as the most common conditions leading to self-medication. Analgesics and antipyretics were the most frequently used medications, while a substantial proportion of students reported antibiotic self-medication.

The study identified time-saving, convenience, and previous successful treatment experiences as the primary factors motivating self-medication practices. Previous prescriptions, textbooks, and internet resources constituted the major sources of medication-related information.

Inferential statistical analysis revealed significant positive relationships among knowledge, attitudes, and self-medication practices. Knowledge and attitude scores emerged as significant predictors of self-medication behavior, confirming the importance of educational and behavioral factors in influencing medication-related decisions.

IX. RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proposed:

9.1 **Educational Recommendations**

1. Regular educational programmes should be organized to increase awareness regarding rational drug use among medical students.
2. Pharmacology teaching should place greater emphasis on adverse drug reactions, drug interactions, contraindications, and medication safety.
3. Structured workshops on rational prescribing practices should be incorporated into the undergraduate medical curriculum.
4. Educational sessions addressing antimicrobial stewardship and antibiotic resistance should be conducted periodically.

5. Case-based learning approaches should be utilized to improve practical understanding of medication-related risks.

9.2 **Institutional Recommendations**

6. Medical colleges should establish awareness campaigns promoting responsible self-medication practices.
7. Student counseling programmes should be introduced to encourage appropriate healthcare-seeking behavior.
8. Easy access to qualified medical consultation services should be ensured for students residing in hostels.
9. Information regarding medication safety should be displayed through posters, seminars, and awareness activities within the institution.
10. Interdisciplinary collaboration between pharmacology, community medicine, and clinical departments should be encouraged to promote rational medication practices.

9.3 **Policy Recommendations**

11. Strict regulations regarding over-the-counter sale of prescription medicines should be enforced.
12. Policies promoting responsible antibiotic dispensing should be strengthened.
13. Public health initiatives addressing antimicrobial resistance should actively involve medical students.
14. Continuous professional development programmes related to medication safety should be encouraged throughout medical education.

X. LIMITATIONS OF THE STUDY

Although the present study provides valuable information regarding self-medication among medical students, certain limitations should be acknowledged.

1. The study was conducted in a single medical institution; therefore, the findings may not be generalizable to all medical colleges in India.
2. The study employed a cross-sectional design, which limits the ability to establish causal relationships between variables.
3. Data were collected through self-reported questionnaires and may therefore be subject to recall bias and social desirability bias.
4. The study focused exclusively on second-year MBBS students and did not include students from other academic years.
5. Self-medication practices were assessed based on respondents' reported behavior rather than direct observation.
6. Certain psychological and environmental factors influencing self-medication behavior were not examined.

Despite these limitations, the study provides useful baseline information regarding self-medication practices among undergraduate medical students.

XI. SUGGESTIONS FOR FUTURE RESEARCH

The following areas are recommended for future investigation:

1. Similar studies may be conducted among students from different academic years to compare self-medication behavior across levels of medical education.
2. Multi-centric studies involving multiple medical colleges may improve generalizability of findings.
3. Longitudinal studies may be undertaken to evaluate changes in self-medication practices over time.
4. Comparative studies involving medical and non-medical students may provide additional insights into the influence of medical education on self-medication behavior.
5. Future studies may investigate psychological, social, and cultural factors influencing self-medication practices.
6. Qualitative studies may be conducted to explore students' perceptions and motivations regarding self-medication in greater depth.
7. Intervention studies assessing the effectiveness of educational programmes on rational drug use may be undertaken.

XII. IMPLICATIONS OF THE STUDY

The findings of the present study have important implications for medical education, clinical practice, and public health.

- Educational Implications: The study highlights the need to strengthen pharmacology education related to medication safety, adverse drug reactions, and rational antibiotic use.

- Clinical Implications: Future physicians should be encouraged to adopt evidence-based medication practices and avoid inappropriate self-medication behavior.
- Public Health Implications: Improved awareness regarding antibiotic resistance and rational medication use may contribute to efforts aimed at combating antimicrobial resistance.
- Research Implications: The findings provide baseline evidence for future studies examining medication-related behaviors among healthcare students and professionals.

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