



# “Multidimensional Analysis of Self-medication among Undergraduate Students Focusing on Determinants and Health Outcomes”

Sinchana S Bhat<sup>1</sup>, Sneha Bhat<sup>2</sup>, Ramdas Bhat<sup>3\*</sup>

<sup>1</sup>PG Student, Department of Pharmacology, Srinivas College of Pharmacy, Valachil, Mangalore. 575003

<sup>2</sup>PG Student, Department of Pharmaceutics, Srinivas College of Pharmacy, Valachil, Mangalore. 575003

<sup>3</sup>Associate Professor, Department of Pharmacology, Father Muller College of Pharmaceutical Sciences, Deralakatte, Mangalore. 575018

**Corresponding author:** ramdas21@gmail.com

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## Abstract

**Background and Objective:** Self-medication is a significant public health concern, particularly among university students in health-science disciplines who frequently bypass professional medical consultations. This study aims to analyze the behavioral determinants influencing self-medication practices and evaluate the associated health outcomes among undergraduate pharmacy students.

**Methods:** A cross-sectional, questionnaire-based observational study was conducted over three months among undergraduate students aged 18–25 years at Srinivas College of Pharmacy, Mangalore. Students were stratified based on academic year, and proportional random sampling was applied. A total of 50 participants were included as part of a pilot exploratory study. Data were collected using a structured, pre-validated questionnaire (Cronbach’s alpha = 0.78) reviewed by subject experts. Data were analyzed using IBM SPSS Statistics 30. Descriptive statistics and chi-square test were applied, with  $p < 0.05$  considered statistically significant.

**Results:** The prevalence of self-medication was 72%. Major determinants included perceived mildness of illness (75%), easy drug availability (72%), and prior experience (69%). Commonly used drugs were analgesics (78%) and antipyretics (64%), with 36% reporting antibiotic use without prescription. While 80% reported symptom relief, 20% experienced adverse drug reactions (ADRs), and 22% reported delayed diagnosis. A significant association was observed between frequent self-medication and adverse outcomes ( $\chi^2 = 6.80, p = 0.009$ ).

**Conclusion:** Self-medication is highly prevalent among pharmacy students. Despite pharmacological knowledge, inappropriate practices such as antibiotic misuse pose potential clinical risks. Targeted pharmacovigilance education and stricter regulatory enforcement are recommended.

**Keywords:** Self-medication, Undergraduate students, Behavioral determinants, Adverse drug reactions, Antibiotic misuse

## 1. Introduction

Self-medication, defined as the use of medicines without professional supervision to treat self-recognized illnesses, has emerged as a significant global public health concern. The practice is particularly common in developing countries, where easy access to medications and limited healthcare accessibility contribute to its widespread use [1,2]. Studies have reported that the prevalence of self-medication among university students ranges from 60% to 90% globally, indicating a high level of engagement in unsupervised drug use within this population [3,4].

Undergraduate students represent a high-risk group due to their increasing independence, academic stress, and greater exposure to health-related information through digital platforms [5]. Demographically, students aged between 18 and 25 years are more likely to practice self-medication, with both male and female students showing comparable patterns, although some studies suggest slightly higher usage among females due to self-care practices. Factors such as urban residence, higher educational exposure, and prior experience with similar illnesses further contribute to this behavior [6].

Self-medication is influenced by multiple determinants, including perceived mildness of illness, previous prescriptions, peer recommendations, and the easy availability of over-the-counter drugs. Analgesics and antipyretics are the most commonly used medications, followed by antibiotics and gastrointestinal drugs. However, inappropriate use, particularly of antibiotics, has been associated with an increased risk of antimicrobial resistance, which is a growing global health threat [7,8].

Although self-medication may provide temporary relief, several studies have reported that approximately 15–25% of individuals experience adverse drug reactions, while others face complications such as incorrect diagnosis, drug interactions, and delayed medical consultation. These outcomes highlight the potential risks associated with irrational drug use among students [9-11].

The need for this study arises from the high prevalence of self-medication among undergraduate students and the limited availability of comprehensive data integrating behavioral determinants, demographic factors, and health outcomes in a single analytical framework. A multidimensional understanding of these factors is essential for developing targeted educational strategies and promoting rational drug use.

Therefore, this study aims to analyze the determinants influencing self-medication practices and evaluate associated health outcomes among undergraduate students. The specific objectives are to determine the prevalence of self-medication, assess demographic and behavioral factors influencing this practice, identify commonly used medications, and examine the relationship between self-medication and health outcomes.

## 2. Methodology

### 2.1 Study Design and Setting

A cross-sectional, questionnaire-based observational study was conducted over a period of three months at Srinivas College of Pharmacy, Mangalore.

## **2.2 Study Population**

The study population included 226 undergraduate students aged 18–25 years.

## **2.3 Sampling Technique and Sample Size**

Students were stratified based on academic year (first to fourth year), and proportional allocation was applied to ensure representation. A simple random sampling method was then used to select participants from each stratum. A total sample size of 50 students was included as a pilot exploratory study considering feasibility, time constraints, and resource availability.

## **2.4 Inclusion Criteria**

- Undergraduate students aged 18–25 years
- Students willing to participate and provide informed consent
- Students present during the data collection period

## **2.5 Exclusion Criteria**

- Students undergoing long-term prescribed medical treatment
- Students with chronic illnesses requiring continuous medication
- Incomplete or improperly filled questionnaires

## **2.6 Data Collection Tool**

A structured, pre-validated questionnaire was developed based on a literature review and expert input. The questionnaire reliability was confirmed with a Cronbach's alpha value of 0.78. Content validation was performed by three faculty experts in pharmacology.

## **2.7 Data Collection Procedure**

Participants were approached in classroom settings at Srinivas College of Pharmacy and informed about the purpose of the study. Written informed consent was obtained before participation. The questionnaires were distributed and collected immediately after completion to ensure data accuracy and completeness. Confidentiality and anonymity were strictly maintained.

## **2.8 Outcome Measures**

- Prevalence of self-medication

- Determinants influencing self-medication practices
- Types of drugs commonly used
- Health outcomes associated with self-medication

### 2.9 Statistical Analysis

Data were analyzed using IBM SPSS Statistics 30. Descriptive statistics (frequency, percentage, mean, standard deviation) were used. Chi-square test was applied to assess associations between categorical variables. A p-value < 0.05 was considered statistically significant.

### 2.10 Ethical Considerations

Participation was voluntary, and informed consent was obtained from all participants. Confidentiality of the data was ensured, and no personal identifiers were recorded.

## 3. RESULTS

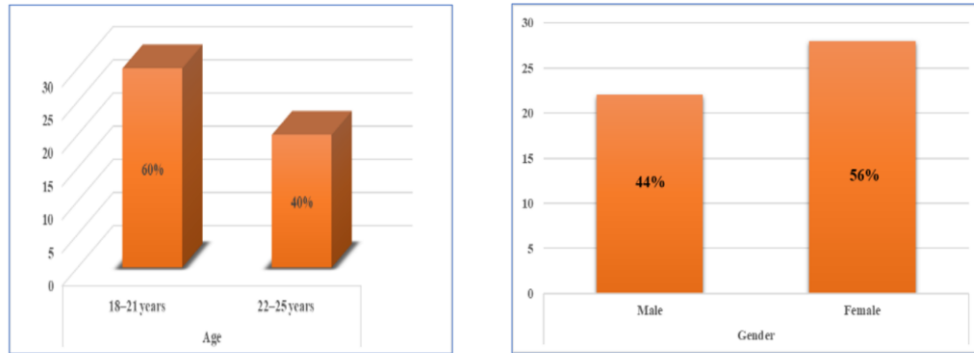
A total of 50 undergraduate students participated in the study. The analysis included both overall participants (n = 50) and those practicing self-medication (n = 36).

### 3.1 Demographic Characteristics

The majority of participants belonged to the age group of 18–21 years (60%), followed by 22–25 years (40%). Female participants (56%) slightly outnumbered males (44%), indicating a balanced representation.

**Table 1:** Demographic Characteristics (n = 50)

Variable	Category	Frequency (n)	Percentage (%)
Age	18–21 years	30	60%
	22–25 years	20	40%
Gender	Male	22	44%
	Female	28	56%



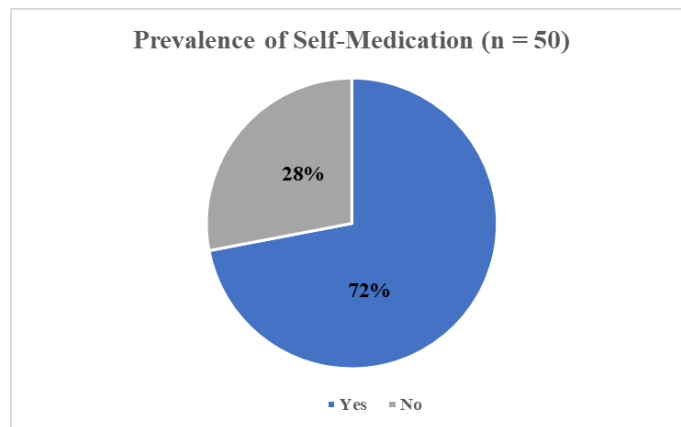
**Figure 1:** Demographic Distribution of Undergraduate Students by Age and Gender (n = 50)

### 3.2 Prevalence of Self-Medication

Out of 50 participants, 36 students (72%) reported practicing self-medication, indicating a high prevalence among undergraduate students.

**Table 2:** Prevalence of Self-Medication (n = 50)

Category	Frequency (n)	Percentage (%)
Yes	36	72%
No	14	28%



**Figure 2:** Pie chart showing prevalence of self-medication

### 3.3 Determinants of Self-Medication

Among the participants practicing self-medication (n = 36), the most common determinant was perceived mildness of illness (75%), followed by easy availability of drugs (72%) and previous experience (69%). Peer and internet influence was also significant (53%).

**Table 3:** Determinants of Self-Medication (n = 36)

Determinant	Frequency (n)	Percentage (%)
Mild illness perception	27	75%
Easy availability	26	72%
Previous experience	25	69%
Peer/Internet influence	19	53%

### 3.4 Types of Drugs Used

The most commonly used medications were analgesics (78%), followed by antipyretics (64%). Antibiotic use was reported by 36% of participants, indicating potential irrational usage.

**Table 4:** Types of Drugs Used (n = 36)

Drug Category	Frequency (n)	Percentage (%)
Analgesics	28	78%
Antipyretics	23	64%
Antibiotics	13	36%
Antacids	15	42%

### 3.5 Health Outcomes

Among students practicing self-medication, 80% reported symptom relief, while 20% experienced adverse drug reactions. Additionally, 22% reported no improvement or delayed diagnosis, indicating potential risks.

**Table 5:** Health Outcomes (n = 36)

Outcome	Frequency (n)	Percentage (%)
Symptom relief	29	80%
Adverse drug reactions	7	20%
No improvement/delay	8	22%

### 3.6 Association Between Frequency of Self-Medication and Adverse Health Outcomes

To determine if the frequency of self-medication impacts patient safety, a cross-tabulation was performed. Adverse drug reactions and delayed diagnosis were considered overlapping outcomes in the association analysis. The results

showed that students who self-medicated frequently had a disproportionately higher incidence of negative health outcomes.

**Table 6:** Association Between Frequency of Self-Medication and Adverse Health Outcomes (n = 36)

Frequency of Self-Medication	Adverse Outcomes Present n (%)	Adverse Outcomes Absent n (%)	Total	$\chi^2$ Value	p-value
Frequent (>2 times/semester)	9 (56.2%)	7 (43.8%)	16	6.80	0.009*
Occasional (1-2 times/semester)	3 (15.0%)	17 (85.0%)	20		
Total	12 (33.3%)	24 (66.7%)	36		

A Chi-square test of independence was conducted to assess the association between the frequency of self-medication and adverse health outcomes. A statistically significant association was observed between the variables,  $\chi^2$  (1, N = 36) = 6.80, p = 0.009. Students who frequently engaged in self-medication were more likely to experience adverse health outcomes compared to those who practiced it occasionally.

#### 4. Discussion

The 72% self-medication prevalence among Srinivas College of Pharmacy undergraduates aligns with a rising global trend of health-science students bypassing professional care. Regionally, this mirrors data from Indian medical students, where prevalence ranges from 73.5% (Wankhade and Shaikh 2024) [12] to 86.5% (Benni et al. 2026) [5]. Middle Eastern data shows similarly high rates, such as 80% in Yemen (Al-Shami et al. 2024) [3], though Jordan reports a lower 45.3% (Alrabadi et al. 2026) [1]. In Europe, over 50% of healthcare students self-medicate (Popa et al. 2025) [8], often to bypass primary care waitlists rather than for affordability or convenience (Baracaldo-Santamaría et al. 2025) [4].

The primary determinants in our study—perceived mildness of illness (75%) and easy drug availability (72%)—corroborate the leading triggers identified by Wankhade and Shaikh (2024) [12]. Furthermore, the significant influence of peers and digital media (53%) reflects a modern trend where online symptom checkers and social media create false diagnostic confidence, as observed in both Europe (Popa et al. 2022) [8] and the UAE (Koornneef et al. 2025) [6].

Pharmacologically, the heavy reliance on analgesics (78%) and antipyretics (64%) is universally consistent (Benni et al. 2026) [5]. However, the 36% prevalence of antibiotic self-medication is an important public health concern, echoing the notable 47.5% rate seen in Yemen (Al-Shami et al. 2024) [3]. While strict regulations lower this practice in Western countries, students there still actively misuse "leftover" prescriptions from previous illnesses (Wiesner et al. 2024) [9].

Finally, while 80% reported temporary relief, the 20% incidence of adverse drug reactions (ADRs) and 22% rate of delayed diagnosis emphasize potential clinical risks (p < 0.05). This gap between pharmacological knowledge and practical safety matches Wankhade and Shaikh (2024) [12], who noted that highly aware students still suffer side

effects. As Petersen et al. (2025) [7] warned, unsupervised concurrent medication effectively "masks" underlying pathologies, reduces drug absorption, and leads to therapeutic failure.

## 5. Conclusion

Self-medication is highly prevalent among undergraduate pharmacy students and is primarily driven by perceived mild illness and easy drug access. While it often provides temporary relief, frequent self-medication is significantly associated with adverse outcomes and delayed diagnosis. The notable prevalence of antibiotic misuse highlights the need for improved pharmacovigilance education and stricter enforcement of prescription regulations.

## 6. References

1. Alrabadi, N., Haddad, R., Al-Azzam, S., Al-Qerem, W., Al-Ubaidi, B., & Al-Domi, H. (2026). Trends in self-medication among university students in Jordan: A nationwide cross-sectional survey. *International Journal of Clinical Pharmacy*, 48(2), 234–241.
2. Aljinović-Vučić, V. (2025). Self-medication as a global health concern: Overview of practices and associated factors—A narrative review. *Healthcare*, 13(15), 1872.
3. Al-Shami, N., Al-Mekhlafi, H. M., Al-Habori, M., Al-Zubairi, A. S., Al-Gheethi, A., Al-Mansoob, M., et al. (2024). Prevalence and determinants of self-medication among healthcare students in Sana'a, Yemen. *BMC Public Health*, 24(1), 112–119.
4. Baracaldo-Santamaría, D., Pérez-Acosta, A. M., García-Lara, M., Silva-Pérez, A., Gómez-Restrepo, C., López-Jaramillo, P., et al. (2025). Systemic drivers of self-medication in the European Union: A narrative review of primary care access and coping mechanisms. *European Journal of Public Health*, 35(1), 45–51.
5. Benni, J. M., Banu, A. B. F., Shindhe, V. M., & Tubaki, B. R. (2026). Self-medication awareness, practices, and influencing factors among Malaysian medical students studying in India: A cross-sectional study. *Journal of Applied Pharmaceutical Science*, 16(3), 456–464.
6. Koornneef, E., Ali, A., Al-Shehhi, M., Al-Mheiri, N., Al-Suwaidi, H., & Al-Hammadi, S. (2025). Digital health applications and unguided self-medication among university students in the United Arab Emirates. *Digital Health*, 11(2), 102–108.
7. Petersen, L., Jensen, M., Nielsen, K., Hansen, P., Larsen, S., & Pedersen, A. (2025). Clinical implications and adverse reactions of concurrent over-the-counter self-medication: A safety review. *Drug Safety*, 48(3), 210–218.
8. Popa, A. D., Enache, A. I., Popa, I. V., Antoniu, S. A., Dragomir, R. A., & Burlacu, A. (2022). Determinants of the hesitancy toward COVID-19 vaccination in Eastern European countries and the relationship with health and vaccine literacy: A literature review. *Vaccines*, 10(5), 672.
9. Wiesner, A., Zagrodzki, P., Gawalska, A., & Paško, P. (2024). Together or apart? Revealing the impact of dietary interventions on bioavailability of quinolones: A systematic review with meta-analyses. *Clinical Pharmacokinetics*, 63(6), 773–818.

10. Nalinidevi, J., Pradeep, T., Manjula, D., Kavitha, G., Swapna, B., & Sujitha, M. (2025). The consequences of self-medication are suggested by pharmacists versus doctors' prescriptions. *International Journal of Academic Medicine and Pharmacy*, 7(1), 777–782.
11. Patel, P. V., Patel, J. J., & Patel, A. C. (2025). A cross-sectional study on self-medication practices among medical students. *Journal of Heart Valve Disease*, 30(7), 58–61.
12. Wankhade, P. A., & Faseehuddin, S. (2024). Evaluation of self-medication practices among medical students and their pharmacological implications. *Journal of Contemporary Clinical Practice*, 10(1), 350–357.