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Original Article

Knowledge, Attitude, and Practices of Self-Medication Among Undergraduate Nursing Students in Malakand Division, Pakistan

Suhail Ahmad[1], Alamgir Khan[2], Jamshid Iqbal[3], Syed Ihtisham[3], Aimal Iqbal[4], Abdullah Iqbal[2], Mudassir Ahmad[5]

[1] The Aga Khan University Hospital, Karachi, Pakistan

[2] Saidu Group of Teaching Hospital, Swat, Pakistan

[3] Pak Swiss Nursing College, Swat, Pakistan

[4] Zubair College of Nursing, Swat, Pakistan

[5] Dir College of Nursing, Dir, Pakistan

Correspondence: rnosuhailahmad@gmail.com

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ABSTRACT

Background: Self-medication is widespread among healthcare students, raising concerns about irrational drug use, antimicrobial resistance, and professional boundary violations. Nursing students are a critical group given their foundational pharmacological knowledge and future patient care responsibilities. Understanding their knowledge, attitudes, and practices (KAP) is essential to inform educational and policy interventions. Objective: To assess the prevalence, determinants, and patterns of self-medication among undergraduate nursing students in Malakand Division, Pakistan, and to evaluate associated knowledge, attitudes, and misconceptions. Methods: A cross-sectional observational study was conducted from February to October 2024 among 267 third- and fourth-year Bachelor of Science in Nursing students across multiple institutions in Malakand Division. Data were collected through a structured, validated, self-administered questionnaire and analyzed in Jamovi using descriptive statistics, chi-square tests, and logistic regression. Odds ratios with 95% confidence intervals were calculated, and $p<0.05$ was considered significant. Ethical approval and informed consent were obtained. Results: The prevalence of self-medication was 78.3%. Painkillers (41.6%) were most frequently used, followed by antibiotics (14.2%) and combined polypharmacy (22.1%). Convenience (46.1%) and limited healthcare access (18.0%) were leading motivators. Female students (95.7%) and fourth-year students (83.2%) reported higher prevalence. Despite high awareness of drug side effects (97.8%) and antibiotic resistance (88.0%), misconceptions persisted regarding herbal remedies (39.7%) and dietary supplements (66.3%). Conclusion: Self-medication is highly prevalent among nursing students, influenced by academic seniority and gender. Persistent misconceptions and boundary issues highlight the urgent need for curricular reforms, stewardship training, and regulatory interventions.

Keywords: Self-medication, Nursing students, Knowledge, Attitudes, Practices, Malakand Division, Antibiotic resistance, Herbal medicine.

INTRODUCTION

Human beings have long practiced self-care through the use of home remedies, herbal preparations, and pharmaceuticals, a behavior that can be categorized as self-medication (1). Self-medication refers to the use of medicines, herbs, or previously prescribed drugs without consulting a licensed healthcare professional, often relying on personal judgment or advice from peers and family (2). It commonly includes reusing leftover prescriptions, purchasing medicines without prescriptions, or exchanging drugs among peers (3). While this practice is widely observed across both developed and developing countries (4), its implications for healthcare systems and population health remain complex. On one hand, responsible self-medication can reduce the burden on healthcare services and provide convenient, low-cost relief for minor ailments (5). On the other, irrational self-medication increases the risk of misdiagnosis, delayed treatment, adverse drug reactions, polypharmacy, and the emergence of antimicrobial resistance (6).

Multiple factors influence self-medication practices, including accessibility of medicines, prior experiences with illness, academic workload, cultural traditions, and increasing availability of online health information (7). University students, particularly those enrolled in health sciences, represent a population with heightened susceptibility to this behavior due to their foundational knowledge of pharmacology and easy access to medications (8). Studies consistently show that health science students engage in self-treatment for common conditions such as pain, fever, and minor infections, often underestimating the risks associated with inappropriate use of

antibiotics and herbal medicines (9). The World Health Organization recognizes the role of self-care in health systems but emphasizes responsible use of medications to prevent irrational practices and resistance (10).

In Pakistan, the problem is particularly acute, with national self-medication prevalence reaching 95.5%—one of the highest in Asia (11). Research in various Pakistani cities, including Karachi, Islamabad, and Bahawalpur, has documented prevalence rates ranging from 70–76% among university students, demonstrating widespread and entrenched patterns of self-treatment (12,13). However, such data are less explored in regions with distinct cultural and socioeconomic dynamics, such as Malakand Division. Here, accessibility of medicines without prescriptions, economic barriers to formal healthcare, and family-driven health traditions contribute to the persistence of self-medication behaviors (14). Nursing students in particular occupy a unique position: while they are educated in drug safety and pharmacology, misconceptions regarding herbal medicines, dietary supplements, and prescribing boundaries may predispose them to irrational self-care practices (15). Such behaviors not only affect their own health but also carry professional implications, as these students will assume roles as future healthcare providers and patient educators.

Despite the growing body of literature, a knowledge gap persists regarding the patterns, motivations, and determinants of self-medication among nursing students in Malakand Division. Understanding their knowledge, attitudes, and practices (KAP) is essential to inform educational interventions, foster professional responsibility, and mitigate risks of irrational drug use. Therefore, this study was designed to assess the prevalence of self-medication and to identify its associated factors among undergraduate nursing students in Malakand Division, Pakistan. The objective was to examine their knowledge, attitudes, and practices regarding self-medication and to determine demographic and academic correlates of this behavior, with the hypothesis that convenience and limited access to healthcare are primary drivers, while misconceptions regarding drug safety and professional boundaries persist among this group.

MATERIAL AND METHODS

This investigation employed a cross-sectional observational design to assess the knowledge, attitudes, and practices of self-medication among undergraduate nursing students in Malakand Division, Pakistan. The study was conducted between February and October 2024 across multiple nursing institutions located in urban and semi-urban areas of the division. This design was chosen as it allows simultaneous assessment of exposure variables and outcomes in a defined population and is widely applied in epidemiological studies exploring health behaviors (16).

The study population consisted of students enrolled in the third and fourth years of the Bachelor of Science in Nursing (BSN) program, as these cohorts had completed formal pharmacology courses, making them an appropriate group for assessing knowledge and practices of drug use. Inclusion criteria required participants to be full-time undergraduate nursing students in these academic years. Students from the first two years of study and those unwilling to provide informed consent were excluded. A sample of 267 students was recruited through a multistage approach, combining online invitations via institutional WhatsApp groups and in-person distribution of questionnaires in classrooms. Participation was voluntary, and informed consent was secured either digitally or in written form before enrollment.

Sample size was determined using the Rao soft online calculator, assuming a 95% confidence level, a 5% margin of error, and an estimated prevalence of self-medication of approximately 75% based on previous regional studies (17). This calculation yielded a minimum requirement of 260 participants, and 267 were ultimately included, ensuring sufficient power to detect significant associations between demographic variables and self-medication practices.

Data were collected using a structured, self-administered questionnaire adapted from prior validated instruments that had been employed in similar research on health science students (18–20). The questionnaire was divided into four domains: demographic characteristics, knowledge, attitudes, and self-reported practices regarding self-medication. Content validity was established through literature review and expert consultation, while face validity was assured by piloting the tool among a small group of nursing students outside the study sample. Internal consistency was examined, yielding a Cronbach's alpha above 0.7, indicating acceptable reliability for all domains. Both online (Google Forms) and offline (hard copies) versions of the tool were used to maximize accessibility and participation.

To minimize potential bias, anonymity was guaranteed, and no identifying information was collected. Data collection was supervised by trained research assistants to reduce response errors. Social desirability bias was addressed by emphasizing confidentiality and the academic nature of the study, while recall bias was mitigated by framing questions around recent experiences.

Data were entered and analyzed using Jamovi version 2.6.44. Descriptive statistics were calculated for all variables, including frequencies, percentages, means, and standard deviations. Associations between demographic characteristics (age, gender, academic year, family background) and self-medication practices were examined using chi-square tests. Odds ratios with 95% confidence intervals were computed for significant associations. Multivariate logistic regression models were specified to adjust for potential confounding factors, including socioeconomic status and family medical background. Missing data were not encountered, as questionnaires with incomplete responses were excluded at the screening stage. A significance threshold of $p < 0.05$ was applied throughout the analysis.

Ethical approval for the study was obtained from the Institutional Review Board of Pak Swiss Nursing College (PSNC-IRB). All participants were informed of the study's objectives, procedures, and their right to refuse or withdraw at any stage without penalty. Written or electronic consent was obtained prior to participation, ensuring compliance with ethical standards for human subject research. The study adhered to principles outlined in the Declaration of Helsinki, and all measures were taken to preserve confidentiality and research integrity (21).

RESULTS

The demographic profile of the 267 participants (Table 1) showed a strong male predominance, with 91.4% (n = 244) of respondents being male compared to only 8.6% (n = 23) females. The age distribution revealed that slightly more than half of the students (52.5%, n = 140) were 23–25 years old, while 44.9% (n = 120) were aged 20–22, and only 2.6% (n = 7) fell into the 26–28 year range. Academic levels were almost evenly distributed between third-year students (48.7%, n = 130) and fourth-year students (51.3%, n = 137). A large majority of students reported being financially dependent on family (74.2%, n = 198), with 18.4% (n = 49) partially dependent and 7.5% (n = 20) independent. Family income patterns indicated that 40.8% (n = 109) had monthly income above 50,000 PKR, while 27.0% (n = 72) reported 41,000–50,000 PKR. Chronic illnesses were uncommon, reported by only 3.0% (n = 8). Notably, 36.0% (n = 96) had family members in the medical or pharmaceutical profession.

Knowledge assessment (Table 2) highlighted a combination of strengths and misconceptions. While 80.9% (n = 216) acknowledged that all drugs can cause adverse effects, 39.7% (n = 106) incorrectly believed that herbal medicines do not have harmful side effects. Awareness of drug–drug interactions was high, with 87.3% (n = 233) recognizing the dangers of combining chemical medicines. However, uncertainty persisted regarding herb–drug interactions, with 29.2% (n = 78) unsure and only 54.3% (n = 145) agreeing they occur. Almost all participants (93.6%, n = 250) recognized that self-medication is dangerous for patients with kidney or liver disease, and 88.0% (n = 235) understood that antibiotic misuse leads to resistance. Conversely, two-thirds (66.3%, n = 177) believed dietary supplements were harmless, reflecting a substantial misconception.

Attitudes toward self-medication (Table 3) demonstrated strong theoretical awareness but mixed perceptions of professional responsibility. Nearly all students (97.8%, n = 261) reported that knowing drug side effects was important, and 95.5% (n = 255) endorsed adherence to prescribed doses and timing. Similarly, 88.7% (n = 237) acknowledged that irrational drug use causes resistance.

Table 1. Participant Demographics (N = 267)

Variable	Category	n	%
Gender	Male	244	91.4
	Female	23	8.6
Age (years)	20–22	120	44.9
	23–25	140	52.5
	26–28	7	2.6
Academic Year	3rd Year	130	48.7
	4th Year	137	51.3
Financial Dependency	Dependent	198	74.2
	Partially Dependent	49	18.4
	Independent	20	7.5
Family Income (PKR)	>50,000	109	40.8
	41,000–50,000	72	27.0
	31,000–40,000	52	19.5
	20,000–30,000	34	12.7
Chronic Illness	No	259	97.0
	Yes	8	3.0
Family in Medical Field	No	171	64.0
	Yes	96	36.0

Table 2. Knowledge of Participants Regarding Self-Medication (N = 267)

Knowledge Statement	Agree/Strongly Agree n (%)	Disagree/Strongly Disagree n (%)	Don't Know n (%)
Appropriate to advise medicine to others	175 (65.5)	82 (30.7)	10 (3.7)
Every drug can cause adverse side effects	216 (80.9)	40 (15.0)	11 (4.1)
Herbal medicine doesn't cause adverse effects	106 (39.7)	127 (47.5)	34 (12.7)
Simultaneous use of chemical drugs is dangerous	233 (87.3)	17 (6.4)	17 (6.4)
Herbal–chemical drug interactions occur	145 (54.3)	44 (16.5)	78 (29.2)
Dangerous for kidney/liver patients	250 (93.6)	8 (3.0)	9 (3.4)
Dietary supplements don't cause adverse effects	177 (66.3)	66 (24.7)	24 (9.0)
Self-medication can hide serious disease	204 (76.4)	44 (16.5)	19 (7.1)
Antibiotic self-medication causes resistance	235 (88.0)	19 (7.1)	13 (4.9)

Table 3. Attitudes of Participants Toward Self-Medication (N = 267)

Attitude Statement	Agree/Strongly Agree n (%)	Disagree/Strongly Disagree n (%)	Don't Know n (%)
Important to know drug side effects	261 (97.8)	3 (1.1)	3 (1.1)
Important to know herbal drug side effects	221 (82.7)	30 (11.2)	16 (6.0)
Importance of drug interactions	233 (87.3)	25 (9.4)	9 (3.4)
Adherence to exact dose/timing	255 (95.5)	8 (3.0)	4 (1.5)
Trust pharmacists for minor disease	193 (72.3)	63 (23.6)	11 (4.1)
Chemical drugs only in emergencies	155 (58.1)	95 (35.6)	17 (6.4)
Approved drugs are totally safe	173 (64.8)	79 (29.6)	15 (5.6)
Irrational use causes resistance	237 (88.7)	10 (3.7)	20 (7.5)

Table 4. Prevalence and Practices of Self-Medication (N = 267)

Variable	Category	n	%
Ever self-medicated	Yes	209	78.3
	No	58	21.7
Conditions self-medicated	All conditions	151	56.6
	Headache	54	20.2
	Fever	23	8.6
	Pain relief	17	6.4
	Cold/cough	11	4.1
	Other	11	4.1
Medicines used	Painkillers	111	41.6
	Antibiotics	38	14.2
	NSAIDs	33	12.4
	Combined use (AB + NSAIDs + Analgesics)	59	22.1
	All classes	23	8.6
	Hypnotics	3	1.1
Reason for self-medication	Convenience	123	46.1
	Lack of healthcare access	48	18.0
	Cost	19	7.1
	All reasons combined	32	12.0
	Other	45	16.9

Table 5. Factors Associated with Self-Medication

Variable	Category	Self-Med Yes n (%)	Self-Med No n (%)	OR (95% CI)	p-value
Age	20–22 yrs	86 (71.7)	34 (28.3)	1.00 (ref)	0.002*
	23–25 yrs	120 (85.7)	20 (14.3)	2.38 (1.28–4.41)	
	26–28 yrs	3 (42.9)	4 (57.1)	0.30 (0.07–1.22)	
Academic Year	3rd year	95 (73.1)	35 (26.9)	1.00 (ref)	0.045*
	4th year	114 (83.2)	23 (16.8)	1.74 (1.01–3.01)	
Gender	Male	187 (76.6)	57 (23.4)	1.00 (ref)	0.035*
	Female	22 (95.7)	1 (4.3)	6.70 (0.88–51.3)	

Table 6. Gender Differences in Motivations and Attitudes Toward Self-Medication

Variable	Category	Female n (%)	Male n (%)	p-value
Main reason for self-medication	Convenience	8 (34.8)	115 (47.1)	0.002*
	Lack of healthcare access	11 (47.8)	37 (15.2)	
	Cost	0 (0.0)	19 (7.8)	
	All combined	3 (13.0)	29 (11.9)	
	Other	1 (4.3)	44 (18.0)	
Acceptability of self-medication	Totally Agree	5 (21.7)	48 (19.7)	0.032*
	Agree	7 (30.4)	120 (49.2)	
	Disagree	6 (26.1)	63 (25.8)	
	Totally Disagree	4 (17.4)	9 (3.7)	
	Don't Know	1 (4.3)	4 (1.6)	

However, 64.8% (n = 173) believed that approved drugs are "totally safe," and only 72.3% (n = 193) expressed trust in pharmacists as reliable sources for minor illnesses. Notably, only 58.1% (n = 155) agreed that chemical drugs should be restricted to emergency use, suggesting divided views on rational prescribing boundaries. Prevalence and practice patterns (Table 4) showed that 78.3% (n = 209) of students had self-medicated, while 21.7% (n = 58) had never done so. Of those practicing self-medication, 56.6% (n = 151) reported using

drugs for "all conditions," while 20.2% (n = 54) used them mainly for headaches, 8.6% (n = 23) for fever, and 6.4% (n = 17) for pain relief. Painkillers were the most frequently used category, reported by 41.6% (n = 111), followed by antibiotics (14.2%, n = 38), NSAIDs (12.4%, n = 33), and polypharmacy involving antibiotics, NSAIDs, and analgesics (22.1%, n = 59). Convenience was the dominant reason cited for self-medication (46.1%, n = 123), while lack of healthcare access was reported by 18.0% (n = 48), and cost by only 7.1% (n = 19).

Inferential analysis (Table 5) identified significant predictors of self-medication. Age was strongly associated (p = 0.002), with prevalence highest among 23–25-year-olds (85.7%, n = 120) compared to 71.7% (n = 86) in the 20–22 group. Students aged 23–25 had more than twice the odds of practicing self-medication compared to the youngest group (OR 2.38, 95% CI 1.28–4.41). Academic year was also significant (p = 0.045), with fourth-year students showing higher prevalence (83.2%, n = 114) than third years (73.1%, n = 95; OR 1.74, 95% CI 1.01–3.01). Gender was a strong determinant (p = 0.035), with female students reporting the highest prevalence (95.7%, n = 22 of 23) compared to males (76.6%, n = 187 of 244). The female odds ratio was elevated (OR 6.70, 95% CI 0.88–51.3), though the wide confidence interval reflected the small female sample.

Finally, gender-specific analyses (Table 6) revealed stark differences in motivations and acceptability. Female students most frequently cited lack of access to healthcare as their reason for self-medicating (47.8%, n = 11), whereas males more often cited convenience (47.1%, n = 115), with this difference statistically significant (p = 0.002). Regarding attitudes, female responses were polarized: 21.7% (n = 5) strongly supported and 17.4% (n = 4) strongly opposed self-medication, compared to males, whose responses were more moderate, with 49.2% (n = 120) agreeing it was acceptable. This divergence reached significance (p = 0.032).

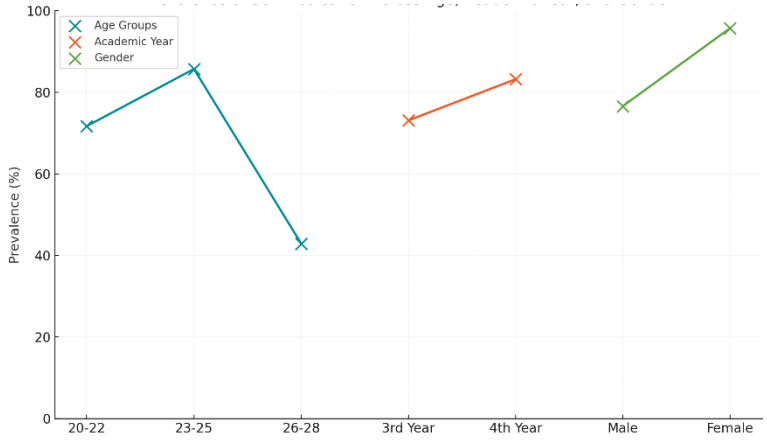

Figure 1 Prevalence of Self-Medication Across Age, Academic Year, and Gender

The visualization shows that self-medication prevalence peaked at 85.7% among 23–25-year-olds, dropped sharply to 42.9% in the 26–28 group, and was intermediate in those aged 20–22 years (71.7%). Prevalence rose from 73.1% in 3rd-year students to 83.2% in 4th years, reflecting higher engagement with increasing academic exposure. Gender differences were most striking: while 76.6% of males reported self-medication, nearly all females (95.7%) did, demonstrating a substantial gender gap. These intersecting trends suggest that both maturity and academic seniority contribute to increased self-medication, but the effect is most pronounced in female nursing students, where prevalence approaches universality.

DISCUSSION

This study demonstrated a high prevalence of self-medication among undergraduate nursing students in Malakand Division, with 78.3% of participants reporting such behavior. This finding is consistent with regional studies conducted in Karachi, Islamabad, and Bahawalpur, where prevalence ranged from 70% to 76% (22,23). Comparable international estimates include 72% in Iran and 80% in Bangladesh (24,25). While the present rate is lower than that reported among Palestinian university students (98%), it remains higher than the 66.2% reported in India and 60% in Saudi Arabia (26,27). The elevated prevalence in Malakand likely reflects the unique interplay of academic pressures, cultural practices, and unregulated pharmaceutical access, which reinforce reliance on self-care in this population.

Analysis of knowledge and misconceptions revealed both strengths and concerning gaps. Most students recognized the risks of inappropriate drug use, with 80.9% acknowledging that all medicines can cause side effects, and 93.6% are aware of potential harm to patients with kidney or liver impairment. Awareness of antibiotic resistance was similarly strong, with 88.0% recognizing the risks of irrational use. However, nearly two in five participants (39.7%) believed herbal medicines do not cause adverse effects, and two-thirds (66.3%) reported dietary supplements as harmless. These misconceptions align with findings from Pakistan and other Asian countries, where herbal remedies are widely perceived as safe and beneficial despite evidence of potential toxicities and interactions (28,29). In contrast, healthcare students in Western countries generally exhibit more caution toward herbal therapies, underscoring cultural influences on risk perception (30).

Attitudinal patterns demonstrated a tension between theoretical awareness and professional responsibility. While nearly all students emphasized the importance of dosing adherence (95.5%) and knowledge of drug side effects (97.8%), 64.8% considered approved drugs "totally safe," and only 72.3% trusted pharmacists for minor illness management. These attitudes suggest overconfidence in regulatory

mechanisms and underutilization of pharmacists as accessible healthcare providers. Moreover, more than half of participants viewed chemical drugs as necessary only in emergencies, while others endorsed more liberal use, indicating mixed perceptions of rational prescribing. Importantly, 65.5% reported it was appropriate to advise medicines to others, reflecting a critical professional boundary issue. Such findings echo reports from Punjab and other developing regions where final-year students demonstrated similar tendencies to assume prescribing roles beyond their training (31).

Practice-level findings further emphasize the risks of inappropriate drug use. Painkillers were the most commonly self-administered category (41.6%), mirroring patterns across Pakistan and the wider region where analgesics and antipyretics dominate self-medication (32,33). Antibiotic use, reported by 14.2% of participants, reflects ongoing challenges with unrestricted access and aligns with prior Pakistani studies reporting rates of 26% to 39% (34,35). More concerning was the use of multiple drug classes concurrently by 22.1% of students, highlighting a trend toward polypharmacy, which has been increasingly reported as a public health concern in Pakistan (36). These practices, if left unaddressed, risk reinforcing patterns of resistance, drug toxicity, and irrational use as students transition into professional roles.

Subgroup analyses revealed important determinants. Female students reported the highest prevalence (95.7%), a trend consistent with evidence suggesting women more frequently self-medicate for reasons such as perceived barriers to healthcare access (37). In this study, nearly half of females (47.8%) cited lack of access to healthcare as their primary motivation, compared to 47.1% of males who emphasized convenience. Academic progression was also associated with higher prevalence, with fourth-year students more likely to self-medicate than third-year peers, reflecting increasing knowledge, confidence, and autonomy with seniority. Age patterns further supported this trend, with prevalence peaking in the 23–25-year group. These findings highlight the complex role of academic exposure in reinforcing both responsible awareness and risky autonomy, underscoring the need for targeted training at later stages of nursing education.

The findings carry several implications. First, while theoretical knowledge of drug safety and resistance is strong, persistent misconceptions regarding herbal therapies and supplements reveal gaps in pharmacology curricula that require urgent attention. Second, professional boundary blurring—evident in the widespread belief that it is appropriate to advise medicines to others—underscores the need for explicit instruction in ethical and legal frameworks of prescribing authority. Third, reliance on antibiotics and combination therapies signals an urgent need for stronger antibiotic stewardship and regulatory enforcement in community settings. Educational interventions, integrated into nursing curricula, should focus not only on rational pharmacology but also on practical case-based discussions that challenge misconceptions, strengthen professional boundaries, and highlight consequences of irrational drug use.

This study is not without limitations. Cross-sectional design prevents causal inferences, and reliance on self-reported data introduces the risk of recall and social desirability biases. The voluntary nature of participation may have led to selection bias, with more motivated students participating. Furthermore, the limited female representation (8.6% of the sample) constrains the precision of gender-based comparisons, as reflected by wide confidence intervals in odds ratios. Finally, the findings reflect nursing students in Malakand Division and may not be generalizable to other populations of healthcare students in Pakistan with differing socioeconomic and cultural contexts.

Despite these limitations, this study provides novel insights into self-medication practices among a critical group of future healthcare providers. By identifying both strengths in theoretical awareness and persistent misconceptions in practice, it highlights priority areas for educational reform and policy-level interventions.

CONCLUSION

Self-medication was found to be highly prevalent among undergraduate nursing students in Malakand Division, with rates driven primarily by convenience and limited healthcare accessibility. While participants demonstrated strong theoretical knowledge of drug safety and antibiotic resistance, critical misconceptions persisted regarding the safety of herbal remedies, dietary supplements, and professional prescribing boundaries. These gaps, coupled with widespread reliance on analgesics, antibiotics, and combination therapies, highlight risks of irrational use and potential contribution to antimicrobial resistance. Female students and those in later academic years exhibited particularly high prevalence, underscoring the influence of both gender-specific barriers and increased confidence with seniority. To address these challenges, nursing curricula must integrate targeted pharmacology education, stewardship training, and boundary-focused ethics modules. At the policy level, stricter enforcement of prescription regulations and expanded access to healthcare services are urgently needed. Collectively, these interventions will help ensure that future nurses are equipped not only with drug knowledge but also with the professional responsibility required to safeguard patient and public health.

REFERENCES

1. World Health Organization. Self-medication practice among patients in a public health care system. East Mediterr Health J. 2011;17(5):409–16. Available from: https://www.emro.who.int/emhj-volume-17/issue-5/article8.html

2. Baracaldo-Santamaría D, Trujillo-Moreno MJ, Pérez-Acosta AM, Feliciano-Alfonso JE, Calderon-Ospina CA, Soler F. Definition of self-medication: a scoping review. Ther Adv Drug Saf. 2022;13:20420986221127500. doi:10.1177/20420986221127500

3. International Pharmaceutical Federation. The story of self-care and self-medication. The Hague: FIP; 2011.

4. Hughes CM, McElnay JC, Fleming GF. Benefits and risks of self medication. Drug Saf. 2001;24(14):1027–37. doi:10.2165/00002018-200124140-00002

5. Behzadifar M, Behzadifar M, Aryankhesal A, Ravaghi H, Baradaran HR, Sajadi HS, et al. Prevalence of self-medication in university students: systematic review and meta-analysis. East Mediterr Health J. 2020;26(7):846–57. doi:10.26719/emhj.20.041

6. Guzmán AF, Caamaño F, Gestal-Otero JJ. Sociodemographic factors related to self-medication in Spain. Eur J Epidemiol. 2000;16(1):19–26. doi:10.1023/A:1007608702063

7. Sinha RR, Ahmad I, Agrawal R, Datta B. Exploring self-medication practices and patterns among medical and nursing students: a cross-sectional study. J Popul Ther Clin Pharmacol. 2023;30(18):2324–30. doi:10.47750/jptcp.2023.30.18.2324

8. Abdelkader AM, Alhassan GT, Albukhaytan WB, Alnoubi EA, AlRasheedi WN, Alomran EA. Self-medication patterns and knowledge among undergraduate health sciences students: a cross-sectional study. SAGE Open Nurs. 2025;11:23779608251330865. doi:10.1177/23779608251330865

9. Agarwal T, Agarwal V, Agarwal P, Sharma D. Use of internet for practice of self-medication: we are heading toward an era of internet pharmacy. Med J Dr DY Patil Vidyapeeth. 2021;14(1):36–9. doi:10.4103/mjdrdypu.mjdrdypu_260_20

10. World Health Organization. Self-care for health and well-being. Geneva: WHO; 2020. Available from: https://www.who.int/health-topics/self-care

11. Binti S, Misli M, Ahmad A, Yusof P, Masri AM, Halimaton T, et al. Knowledge, attitude, and practice of undergraduate nursing students regarding self-medication. SSRG Int J Nurs Health Sci. 2020;7(1):1–7.

12. Syed S, Waqar R, Zubairi SJ, Vaqar A, Shaikh T, Yousaf M, et al. Self-medication amongst university students of Karachi: prevalence, knowledge and attitudes. J Pak Med Assoc. 2008;58(4):214–8.

13. Bashir M. Pattern of self-medication and associated factors: a study in Islamabad, Pakistan. Qlantic J Soc Sci. 2022;3(1):17–26.

14. Muhammad P, Qadir I, Asghar S, Qadir MI. Self-medication in Bahauddin Zakariya University, Multan, Pakistan. J Rashid Latif Med Coll. 2023;2(1):25–31.

15. Dilie A, Gualu T, Haile D, Zuleta FA. Knowledge, attitude and practice of self-medication among health science students at Debre Markos University, Northwest Ethiopia. J Public Health Epidemiol. 2017;9(5):106–13. doi:10.5897/JPHE2016.0890

16. Alanazi FJ, Lopez LP, Daoala ALC, Jacinto-Caspillo I, Conde MT, Lopez HT, et al. Knowledge, attitude, and practices on self-medication among nursing students of Northern Border University: a cross-sectional study. J Neonatal Surg. 2025;14(24S):713–25. doi:10.47338/jns.v14.6039

17. Adebisi AA. Knowledge and practice of self-medication among students of school of nursing in selected schools in Osun State. Texila Int J Public Health. 2016;4(4):328–37.

18. Niroomand N, Bayati M, Seif M, Delavari S, Delavari S. Self-medication pattern and prevalence among Iranian medical sciences students. Curr Drug Saf. 2019;15(1):45–52. doi:10.2174/1574886314666191023154957

19. Jami MABS. Knowledge, attitude and awareness about self-medication among Bangladeshi people: a cross-sectional study. Health Policy Technol. 2023;12(1):100715. doi:10.1016/j.hlpt.2022.100715

20. Kumaran Shri M, Dande Rajasekar V, Murthy G, Sundaraboopathy K, Kumar AR, Ramesh H. Assessment of self-medication practices and knowledge among medical students in Chengalpattu District: a cross-sectional study. Indian J Public Health Res Dev. 2024;15(2):112–8.

21. Al-Qahtani AM, Shaikh IA, Shaikh MAK, Mannasaheb BA, Al-Qahtani FS. Prevalence, perception, practice, and attitudes towards self-medication among undergraduate medical students of Najran University, Saudi Arabia: a cross-sectional study. Risk Manag Healthc Policy. 2022;15:257–76. doi:10.2147/RMHP.S349928

22. Sawalha AF. Self-medication practices among Palestinian medical and nonmedical university students: a descriptive study. Res Social Adm Pharm. 2008;4(2):164–72. doi:10.1016/j.sapharm.2007.04.004

23. Khan S, Iqbal S, Khan R, Wei CR, Osama M, Shaikh S, et al. Exploring the acceptance and perceptions of herbal medicine among the general public in Pakistan: a societal perspective. J Popul Ther Clin Pharmacol. 2023;30(4):892–9. doi:10.47750/jptcp.2023.30.04.3386

24. Wachtel-Galor S, Benzie IFF. Herbal medicine: biomolecular and clinical aspects. 2nd ed. Boca Raton: CRC Press; 2011.

25. Niemeyer K, Bell IR, Koithan M. Traditional knowledge of Western herbal medicine and complex systems science. J Herb Med. 2013;3(3):112–9. doi:10.1016/j.hermed.2013.04.002

26. Aziz K, Aeymon HM, Batool S. Independent prescription of medicines and diagnostic test advice by final year medical students in Punjab. East Mediterr Health J. 2017;23(12):795–802. doi:10.26719/2017.23.12.795

27. Brata C, Gudka S, Schneider CR, Clifford RM. Provision of appropriate advice by pharmacy staff for self-medication in developing countries: a review. Res Social Adm Pharm. 2015;11(2):136–53. doi:10.1016/j.sapharm.2014.07.003

28. Mustafa ZU, Iqbal S, Asif HR, Salman M, Jabbar S, Mallhi TH, et al. Knowledge, attitude and practices of self-medication including antibiotics among healthcare professionals during the COVID-19 pandemic in Pakistan: findings and implications. Antibiotics (Basel). 2023;12(3):502. doi:10.3390/antibiotics12030502

29. Alhur A, Alghamdi L, Alqahtani F, Alshammari M, Hattany H, Akshah A, et al. Awareness, knowledge, attitudes, and practices regarding antibiotic resistance. Cureus. 2024;16(6):e62854. doi:10.7759/cureus.62854

30. Asim F, Ramzan HM, Raja SA, Mazhar K, Mustafa MW, Tariq K, et al. Evaluation of medication knowledge, attitudes and self-medication practices among pharmacy students. J Popul Ther Clin Pharmacol. 2024;31(4):1079–86. doi:10.47750/jptcp.2024.31.04.5635

31. View of frequency of self medication among health science students in Foundation University Medical College, Islamabad, Pakistan. Life Sci. 2025;17(2):505–12. Available from: https://lifenscience.org/index.php/life-and-science/article/view/505/344

32. Aziz MM, Masood I, Yousaf M, Saleem H, Ye D, Fang Y. Pattern of medication selling and self-medication practices: a study from Punjab, Pakistan. PLoS One. 2018;13(3):e0194240. doi:10.1371/journal.pone.0194240

33. Afridi MI, Rasool G, Tabassum R, Shaheen M, Siddiqullah, Shujauddin M. Prevalence and pattern of self-medication in Karachi: a community survey. Pak J Med Sci. 2015;31(5):1241–5. doi:10.12669/pjms.315.8216

34. Limaye D, Saeed F, Ahmad M, Pitani RS, Fortwengel G. Self-medication practices among university students from Karachi, Pakistan. Int J Community Med Public Health. 2017;4(9):3076–81. doi:10.18203/2394-6040.ijcmph20173857

35. Nazir S, Azim M. Assessment of antibiotic self-medication practice among public in the northwestern region of Pakistan. Eur J Hosp Pharm. 2016;24(4):200–5. doi:10.1136/ejhpharm-2016-000967

36. Abid Minhas A. The growing problem of polypharmacy in Pakistan: an urgent need for intervention. Medtigo J Pharmacol. 2024;1(1):21–5. Available from: https://journal.medtigo.com/the-growing-problem-of-polypharmacy-in-pakistan-an-urgent-need-for-intervention

37. Professional Boundaries. National Council of State Boards of Nursing. 2025. Available from: https://www.ncsbn.org/nursing-regulation/practice/professional-boundaries.page