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Original Article

The Student, The Symptom, and The Saving: Unpacking Self-Medication in Abbottabad Pakistan Healthcare Education

Fida Muhammad[1], Sumara Zafar[2], Naila Riaz[3], Tahira Sultana[4], Bibi Riffat[1], Samreen Polous[5]

[1] King Abdullah Teaching Hospital, Mansehra, Pakistan

[2] Punjab Institute of Mental Health, Lahore, Pakistan

[3] B.B.S Teaching Hospital, Abbottabad, Pakistan

[4] DHQ Hospital, Abbottabad, Pakistan

[5] Allama Iqbal Memorial Teaching Hospital, Sialkot, Pakistan

Correspondence: fida2040276@gmail.com

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ABSTRACT

***Background**: Self-medication is a widespread global practice that poses substantial risks, including inappropriate drug use, adverse reactions, and antimicrobial resistance. Healthcare students are particularly vulnerable due to partial medical knowledge and easy access to medications. Despite the high prevalence of self-medication in Pakistan, limited evidence exists on its determinants among students nearing professional entry.* ***Objective**: To examine the prevalence of self-medication and assess its socioeconomic determinants among final semester nursing and paramedics students in Abbottabad, Pakistan.* ***Methods**: A cross-sectional survey was conducted between March and June 2023 among 309 final semester students. Participants completed a validated questionnaire assessing demographics, socioeconomic background, and self-medication practices. Descriptive statistics were calculated, and associations between socioeconomic variables and self-medication were examined using chi-square tests and logistic regression. Ethical approval was obtained, and written informed consent was secured.* ***Results**: Of 309 students, 240 (77.6%) reported self-medication. The most common reasons were use of old prescriptions (75.0%) and saving time (62.5%). Students from households earning less than 50,000 PKR were nearly five times more likely to self-medicate compared to higher-income peers (OR = 4.67; 95% CI: 2.15–10.13, $p < 0.001$). Fathers' private-sector employment was also associated with increased prevalence (OR = 3.87; 95% CI: 1.89–7.93, $p < 0.001$).* ***Conclusion**: Self-medication is pervasive among healthcare students in Abbottabad and is strongly shaped by socioeconomic factors. Targeted curricular interventions and improved access to affordable health services are needed to reduce unsafe self-medication behaviors.*

***Keywords**: self-medication, nursing students, paramedics, socioeconomic determinants, Pakistan, healthcare education.*

INTRODUCTION

Self-medication, defined as the use of medicines to treat self-diagnosed conditions without professional consultation, has emerged as a pressing global public health concern (1). Although often perceived as a convenient and cost-saving strategy, this practice is associated with serious risks, including incorrect dosage, inappropriate drug selection, adverse drug interactions, and the development of antimicrobial resistance (2). The World Health Organization has identified self-medication as a growing challenge that undermines safe healthcare practices, particularly in settings where regulatory oversight of pharmaceuticals is weak (3).

The prevalence of self-medication varies globally, influenced by cultural, structural, and socioeconomic factors. In high-income countries, the widespread availability of over-the-counter medications, coupled with high healthcare costs and lengthy wait times, encourages individuals to self-treat for minor ailments (4). In contrast, in low- and middle-income countries (LMICs) such as Pakistan, limited access to healthcare infrastructure, financial constraints, and reliance on pharmacies as primary healthcare sources exacerbate the tendency toward self-medication (5). Studies in South Asia have consistently shown that lower-income populations are more likely to engage in self-medication due to the dual pressures of limited affordability and accessibility of healthcare services (6).

Healthcare students, particularly those in nursing and paramedics programs, represent a unique population where self-medication practices warrant special attention. These students often possess partial medical knowledge and have easy access to medications, which may reinforce a sense of confidence in self-treatment (7). Research has demonstrated that healthcare students exhibit higher rates of self-medication than their peers in other disciplines, driven by both familiarity with drugs and perceived time pressures (8). While their clinical

training equips them with knowledge of pharmacological principles, the overextension of this knowledge can foster risky health behaviors that may persist into their professional practice and influence patient care (9).

In Pakistan, cultural acceptance of self-treatment and unrestricted pharmacy access further normalize this behavior (10). Studies from rural and urban regions alike have documented high rates of self-medication among general populations, with cost of consultations and use of old prescriptions frequently cited as drivers (11). Yet, despite extensive evidence in broader communities, focused research on self-medication among healthcare students, especially those nearing professional entry, remains limited. This gap is significant, as final semester students are transitioning into clinical roles and may carry entrenched self-medication practices into their professional responsibilities.

The population of interest in this study is final semester nursing and paramedics students in Abbottabad, Pakistan, a region where healthcare access challenges are compounded by socioeconomic disparities. The intervention/exposure under investigation is self-medication behavior, including frequency, reasons, and commonly used drug types. The comparison groups are stratified across socioeconomic factors such as household income and parental occupation. The outcome is the prevalence of self-medication and its association with these socioeconomic determinants.

The objective of this study is to determine the prevalence of self-medication among final semester nursing and paramedics students in Abbottabad and to evaluate the relationship between self-medication practices and socioeconomic factors, particularly household income and parental occupation. By identifying these determinants, the study seeks to inform educational interventions and policy measures aimed at reducing risky medication practices among future healthcare professionals.

MATERIALS AND METHODS

This study employed a cross-sectional observational design to assess the prevalence of self-medication and its association with socioeconomic determinants among final semester nursing and paramedics students in Abbottabad, Pakistan. The cross-sectional approach was selected as provides a snapshot of behaviors and exposures at a single point in time, a method widely utilized in public health research to investigate self-care practices in healthcare students (12).

The research was conducted between March and June 2023 across nursing and paramedics institutions in Abbottabad. This setting was selected due to its diverse mix of government and private institutions, which attract students from a range of socioeconomic backgrounds. Eligible participants were students in the final semester of their respective programs, aged between 20 and 30 years, and willing to provide informed consent. Inclusion was limited to final semester students to ensure that participants had completed substantial training in healthcare sciences, thereby reflecting the subgroup most relevant to the transition into clinical practice. Students who declined to provide consent or submitted incomplete questionnaires were excluded.

A purposive sampling strategy was used to recruit participants. Faculty members and student coordinators assisted in disseminating information about the study, and recruitment occurred during scheduled classes and examinations. Participants were informed verbally and in writing about the objectives of the study, and written informed consent was obtained prior to data collection. Confidentiality was assured, and participation was voluntary without academic consequences.

Data were collected using a structured, self-administered questionnaire adapted from previously validated instruments on self-medication practices (13). The instrument included two main sections: demographic and socioeconomic information (gender, age, program of study, living arrangements, household income, and parental occupation) and self-medication behaviors (frequency, reasons, types of medications used, and sources of medicines). The draft questionnaire was piloted among 30 healthcare students not included in the final sample, and revisions were made for clarity and cultural appropriateness. The final instrument demonstrated high internal consistency with a Cronbach's alpha of 0.85. Surveys were administered in both paper and electronic formats to maximize participation, with students given up to one week to complete the questionnaire.

Operational definitions were applied consistently: self-medication was defined as the use of any pharmaceutical product to treat self-identified symptoms without consulting a licensed healthcare professional within the preceding 12 months. Household income was stratified into three categories (<50,000 PKR, 50,000–100,000 PKR, and >100,000 PKR per month), and parental occupation was classified as government-employed, private-employed, business, or unemployed/retired.

Several steps were taken to minimize bias. To reduce recall bias, participants were instructed to report only practices within the past year. Social desirability bias was addressed by ensuring anonymous responses and clarifying that there were no right or wrong answers. Confounding was addressed analytically by stratifying results across socioeconomic subgroups.

The sample size was 309 participants, determined a priori to provide sufficient statistical power for subgroup analyses based on previous prevalence estimates of self-medication in similar populations (14). Data were entered and analyzed using SPSS version 25 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including frequencies and percentages, were calculated for sociodemographic characteristics and self-medication practices. Associations between categorical variables, including household income, parental occupation, and self-medication, were assessed using Pearson's chi-square test. To explore further relationships and adjust for potential confounders, logistic regression models were specified with self-medication as the dependent variable and socioeconomic indicators as predictors. All statistical tests were two-tailed, with significance set at $p < 0.05$. Missing data were handled through listwise deletion when responses were incomplete, and frequencies of missing data were documented to assess potential bias.

Ethical considerations were observed in accordance with the Declaration of Helsinki (15). Ethical approval was obtained from the institutional ethics committee of the King Abdullah Teaching Hospital, Mansehra. Participants provided written informed consent prior to participation. To ensure data integrity and reproducibility, data entry was cross-verified by two independent researchers, and all analyses were independently replicated by a third researcher. Study protocols and data management procedures were documented to allow replication in future research.

RESULTS

Of the 309 participants included in the study, 240 students reported practicing self-medication, yielding a prevalence of 77.6% in this cohort. While the proportion of female students engaging in self-medication (79.4%) was slightly higher than that of males (75.0%), this gender-based difference did not reach statistical significance (p = 0.28). The overall prevalence underscores that more than three-quarters of healthcare students nearing the completion of their training had relied on self-medication within the past year, marking this as a widespread behavior among the future healthcare workforce.

The analysis of reasons for self-medication revealed that prior medical prescriptions were the strongest driver of this behavior, with 180 students (75.0%) reporting that they reused old prescriptions without professional consultation. Time constraints were also influential, with 150 students (62.5%) identifying time-saving as their primary rationale. Half of the students (50.0%) relied on previous personal experiences with similar symptoms, while 41.7% self-medicated for minor ailments that they perceived did not warrant medical consultation. Cost of consultation was cited by 37.5% of students, highlighting the economic burden of seeking professional care. Together, these findings indicate that convenience and economic considerations were pivotal in shaping self-medication behaviors, often outweighing concerns about safety or appropriateness.

Table 1. Sociodemographic Characteristics of the Study Participants (N = 309)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	120	38.8
	Female	189	61.2
Program of Study	Nursing	200	64.7
	Paramedics	109	35.3
Living Status	With family	210	68.0
	Hostel	99	32.0
Household Income	<50,000 PKR	100	32.4
	50,000–100,000 PKR	150	48.5
	>100,000 PKR	59	19.1
Father's Occupation	Government	80	25.9
	Private	140	45.3
	Business	60	19.4
	Retired/Unemployed	29	9.4
Mother's Occupation	Homemaker	250	80.9
	Employed	59	19.1

Table 2. Patterns and Reasons for Self-Medication (n = 240)

Reason for Self-Medication	Frequency (n)	Percentage (%)
Use of old prescription	180	75.0
To save time	150	62.5
Previous experience	120	50.0
Minor illness	100	41.7
Cost of doctor consultation	90	37.5

Table 3. Association Between Sociodemographic Factors and Self-Medication Practices (N = 309)

Variable	Category	Self-Medication Yes n (%)	Self-Medication No n (%)	χ^2 value	p-value	Odds Ratio (95% CI)
Household Income	<50,000 PKR	90 (90.0)	10 (10.0)	19.34	<0.001	4.67 (2.15–10.13)
	50,000–100,000 PKR	120 (80.0)	30 (20.0)			2.67 (1.39–5.12)
	>100,000 PKR	30 (50.8)	29 (49.2)			Reference
Father's Occupation	Government	65 (81.3)	15 (18.7)	16.30	<0.001	2.44 (1.12–5.32)
	Private	125 (89.3)	15 (10.7)			3.87 (1.89–7.93)
	Business	40 (66.7)	20 (33.3)			1.02 (0.46–2.28)
	Retired/Unemployed	10 (34.5)	19 (65.5)			0.28 (0.11–0.71)

Household income emerged as a strong predictor of self-medication practices. Students from households earning less than 50,000 PKR monthly reported the highest prevalence, with 90 out of 100 (90.0%) engaging in self-medication. Their odds of self-medicating were nearly five times greater compared to peers from households with incomes exceeding 100,000 PKR (OR = 4.67; 95% CI: 2.15–10.13, p <

0.001). Those in the intermediate-income group (50,000–100,000 PKR) also demonstrated elevated rates, with 80.0% self-medicating and a 2.67-fold higher likelihood relative to the highest-income group (95% CI: 1.39–5.12, p = 0.003). These findings confirm a strong inverse gradient between socioeconomic status and reliance on professional healthcare services, suggesting that financial constraints substantially shape health-related decision-making among students.

Father's occupation further stratified self-medication behaviors. Students whose fathers worked in the private sector demonstrated the highest prevalence, with 125 of 140 (89.3%) reporting self-medication. This subgroup was nearly four times more likely to self-medicate than students with fathers engaged in business occupations (OR = 3.87; 95% CI: 1.89–7.93, p < 0.001). Similarly, those whose fathers were employed in government positions also showed high prevalence (81.3%), with a more than twofold increase in odds compared to business backgrounds (OR = 2.44; 95% CI: 1.12–5.32, p = 0.028).

In contrast, students from households where fathers were unemployed or retired exhibited the lowest rates of self-medication at 34.5%, with significantly reduced odds relative to business-occupation families (OR = 0.28; 95% CI: 0.11–0.71, p = 0.008). These findings suggest that employment-related socioeconomic pressures may exert a profound influence on self-care behaviors, particularly among households in the private sector.

Taken together, the results demonstrate a consistently high prevalence of self-medication across the cohort, with socioeconomic disparities strongly influencing the magnitude of this behavior. Economic constraints, parental employment status, and the convenience of reusing old prescriptions or avoiding time-consuming consultations were identified as dominant drivers, while gender and program of study showed no significant impact. These patterns highlight the importance of addressing structural barriers and health education gaps in order to mitigate the risks associated with self-medication in healthcare student populations.

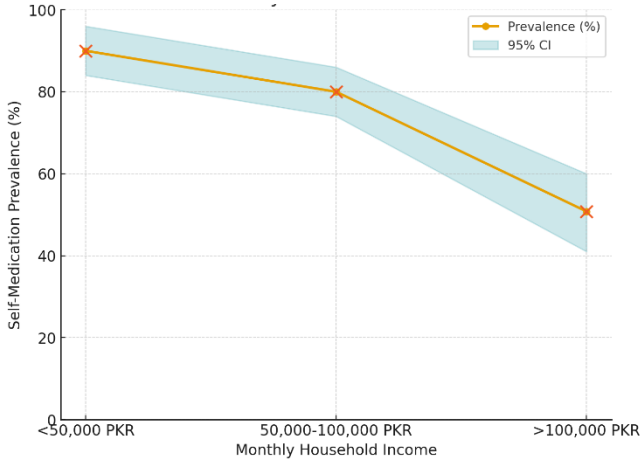

Figure 1 Prevalence of Self-Medication by Household Income in Abbottabad Students

The figure illustrates the relationship between monthly household income and self-medication prevalence among final semester nursing and paramedics students. Prevalence was highest in households earning less than 50,000 PKR per month, with 90.0% of students reporting self-medication (95% CI: approximately 84–96%). Students from middle-income households (50,000–100,000 PKR) demonstrated slightly lower rates at 80.0% (95% CI: 74–86%), while those from higher-income households (>100,000 PKR) showed a markedly reduced prevalence of 50.8% (95% CI: 41–60%). The trend line indicates a clear inverse gradient, highlighting that financial constraints substantially increase the likelihood of self-medication. This pattern underscores the socioeconomic vulnerability of low-income students, for whom cost barriers to healthcare consultations appear to translate into greater reliance on self-care practices.

DISCUSSION

The present study found that more than three-quarters of final semester nursing and paramedics students in Abbottabad reported practicing self-medication within the past year, confirming that this behavior is both widespread and deeply embedded in this student population. The prevalence of 77.6% observed here is consistent with prior studies conducted among healthcare students in South Asia, which have documented similarly high levels of self-treatment, often attributed to perceived medical knowledge and the convenience of accessing medications (16). The current findings extend this literature by demonstrating that, beyond knowledge and convenience, socioeconomic determinants such as household income and parental occupation significantly shape the likelihood of engaging in self-medication.

The observation that students from lower-income households were nearly five times more likely to self-medicate than those from higher-income households underscores the role of financial barriers in shaping health behaviors. Previous research in Pakistan and other low- and middle-income countries has similarly highlighted cost-related obstacles to professional consultations as a major driver of self-care practices (17). In contexts where healthcare costs represent a substantial burden for families, students may resort to using old prescriptions or over-the-counter drugs rather than seeking formal medical advice. This pattern reinforces a broader structural inequity, where limited financial resources push individuals toward potentially unsafe practices.

Parental occupation, particularly employment in the private sector, also demonstrated a significant association with higher self-medication prevalence. Students with fathers in private employment were nearly four times more likely to self-medicate than those from business

backgrounds, suggesting that occupational status and related socioeconomic stressors may influence decision-making around healthcare. These findings resonate with evidence from other LMICs showing that occupational insecurity, job-related stress, and irregular access to employer-based health benefits can indirectly affect the health-seeking behaviors of dependents (18). In contrast, students from households with retired or unemployed fathers exhibited markedly lower prevalence, which may reflect differing household dynamics, reduced access to discretionary funds for self-purchased medications, or greater reliance on external healthcare providers.

Gender and program of study did not significantly influence self-medication in this cohort, a finding in line with studies reporting that knowledge of pharmacological treatments, rather than demographic background, is the dominant factor in shaping self-care practices among healthcare students (19). The primary reasons cited—reuse of old prescriptions, saving time, and avoidance of consultation costs—illustrate that convenience and economic considerations outweigh perceived risks, a trend consistent with studies in both developed and developing settings (20).

The implications of these findings for healthcare education are considerable. High rates of self-medication among students preparing to enter the workforce raise concerns about the normalization of this behavior in clinical practice. Without corrective educational interventions, students may carry these practices into professional roles, potentially perpetuating unsafe behaviors among patients. Incorporating targeted modules on rational drug use, risks of antimicrobial resistance, and ethical responsibilities of healthcare providers into nursing and paramedics curricula could help mitigate these risks (21). Furthermore, universities and training institutions should implement structured counseling programs and ensure that affordable student health services are available, reducing the reliance on self-treatment due to financial or accessibility constraints.

This study has several limitations that warrant consideration. The cross-sectional design precludes causal inference, and associations between socioeconomic determinants and self-medication cannot be interpreted as definitive causal relationships. The reliance on self-reported data introduces the possibility of recall bias or underreporting, particularly if students perceived their practices as socially undesirable. Additionally, the purposive sampling of final semester students in a single geographic region may limit generalizability to other healthcare student populations across Pakistan or South Asia. Despite these limitations, the study provides robust quantitative evidence of socioeconomic gradients in self-medication, supported by statistically significant associations and effect estimates.

Future research should build on these findings through longitudinal designs to capture changes in self-medication behaviors as students transition into professional roles. Qualitative investigations would also offer richer insights into the personal, cultural, and institutional factors underlying these practices. Comparative studies across different regions and healthcare disciplines could help identify broader patterns and inform the design of national strategies to reduce unsafe self-medication practices among healthcare trainees.

In summary, this study adds to the growing body of evidence that self-medication is pervasive among healthcare students in Pakistan and that socioeconomic pressures play a pivotal role in shaping this behavior. Addressing these drivers through educational, institutional, and policy-level interventions is essential to ensure that the next generation of healthcare providers adopts safe, evidence-based practices that can positively influence the communities they will serve.

CONCLUSION

This study demonstrated that self-medication is highly prevalent among final semester nursing and paramedics students in Abbottabad, with over three-quarters reporting this practice. The use of old prescriptions, saving time, and avoiding consultation costs were the dominant drivers, underscoring how convenience and financial pressures shape health-seeking behaviors. Significant associations were identified between self-medication and socioeconomic determinants, particularly low household income and fathers' employment in the private sector, highlighting structural inequities that reinforce reliance on self-treatment. The findings emphasize an urgent need for targeted educational interventions within healthcare curricula to raise awareness about the risks of unsupervised medication use, including antimicrobial resistance and drug-related complications. Institutional policies that expand affordable student health services, alongside national strategies to regulate over-the-counter drug availability, are critical steps to reduce reliance on self-medication. By addressing these drivers, it will be possible to promote safer practices among healthcare students and strengthen their capacity to model evidence-based behaviors in their future professional roles.

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