International Journal of Media & Development Communication
Vol 1 | Issue 1 | December 2025 | 71-83

Self-Medication Practices Among University Students: A Case of Gilgit-Baltistan

Faiza Muneeb[a] and Aneela[b]

[a]Department of Media and Communication, Karakoram International University, Gilgit-Baltistan, Pakistan: [b]Research Centre for Communication and Culture (CECC), Universidade Católica Portuguesa, Faculty of Human Sciences Lisboan, Portugal

Received: September 12, 2025; Accepted: October 28, 2025; Published: December 30, 2025

Abstract

Self-medication the consumption of drugs without a doctor-prescription is now a serious international health-related issue. It is specifically worrying within the low-resource environments, where economic deprivation, lack of medical services, and social values promote informal care. This paper aims to explore how common, why, and why self-medication is among the students at Karakoram International University (KIU) located in Gilgit-Baltistan, Pakistan. The cross-sectional quantitative survey was carried out with 181 students in different faculties. The SPSS v.23 was used to analyze the data through descriptive and Chi-square tests. The findings showed that most respondents engaged in self-medication (74.6 percent) and it was mainly due to colds and flu and headaches. The most common drugs were Panadol (34.3 percent), Paracetamol (27.1 percent), and Ponistan (13.3 percent). Preceding experience (42 percent), inaccessibility to healthcare (28.2 percent) and financial limitations (21 percent) were major motivations. Interestingly, 47 percent felt that antibiotics could heal viral infections and over half of them recommended self-medication. The results show that there exist deeply seated behavioral, cultural, and structural determinants of self-medication. The exclusive health-literacy programs and advocacy measures at the university, health communication related projects, and regulations of the medical policy, are in vital requisite to lessen perilous drug usage in Gilgit-Baltistan and other underserved districts.

Keywords: Self-medication; university students; antibiotic misuse; Gilgit-Baltistan; Pakistan; health behavior; over-the-counter drugs.

1. Introduction

Self-medication has been identified as a two-sided phenomenon as it may give people control over minor conditions, but on the other hand, improper use of medications without medical guidance causes antimicrobial resistance (AMR), concealment of severe conditions, and drug toxicity. Self-medication refers to the process of people choosing and using medicines to treat themselves because of symptoms that they identify (World Health Organization, 1998). The necessity to control the use of non-prescription drugs and improve the health literacy of the population is

Publisher: Department of Media and Development Communication, University of the Punjab, Lahore, Pakistan.

emphasized by the global initiatives, including the WHO Global Action Plan on Antimicrobial Resistance (2015).

Self-medication is a common practice in developing nations since they do not have proper health facilities, are poor, and must travel far to see the doctor. Research on Asia, Africa, and Latin America demonstrates that non-prescribed drugs are used by up to 80-90 percent of people to treat minor ailments (Kazemioula et al., 2022; Bollu et al., 2014). It is also supported by the intensive pharmaceutical advertising campaigns and the idea that the most ordinary painkillers and antibiotics are non-dangerous home therapies.

Mostly disrupted health care delivery, high out-of-pocket spending and poor regulation have made self-medication common in Pakistan. Studies in Pakistan, including those in Islamabad and Karachi, show prevalence of over 70 percent among students at universities (Abbas et al., 2024; Asif et al., 2023; Shah et al., 2014). Nevertheless, very little is known about the remote areas that include Gilgit-Baltistan (GB) and other parts of north where access to hospitals is limited due to mountainous nature and other extreme weather factors. In GB, the ratio doctor to population stands at about 1:5 000, which is significantly lower than the recommendable limit of WHO (PHC Report, 2023). Gilgit-Baltistan is a territory that is mostly rugged, with poor population density, and is not well connected, therefore there is a unique problem of delivering public health in the area. Also, landslides and roadblocks block access to many villages during monsoons further cutting off communities to emergency care. These institutional obstacles make formal healthcare systems ineffective to a substantial proportion of the population particularly youth and students in their quest to seek higher education at the expense of long distances. Students in Karakoram International University (KIU) have to travel long distances (distant valleys) such as Hunza, Ghizer, Diamer and Skardu and have financial constraints as well as sociocultural barriers- particularly the female students who are not supposed to talk to male doctors.

This paper adds empirical data in this context that has not been studied much. It explores the level, reasons and practices of self-medication among the students of KIU and the way gender, geography and education affect these habits. The study also contextualizes self-medication in the Bio-Psychosocial Model (Engel, 1977) in that behavior is only a wise adjustment to structural health inequities and not irresponsibility.

2. Literature Review

The prevalence of self-medication is dependent on socioeconomic factors, health care facilities, and cultural orientation. A meta-analysis among the world community found the highest prevalence was 68 percent in developed and 92 percent in developing countries (Kazemioula et al., 2022). The most mentioned reasons are convenience, cost-saving, previous experience, and mild symptomatology (Gashaw et al., 2025). In the COVID-19 pandemic, fear and limited access to healthcare increased the use of antibiotics (Yeamans et al., 2024), which shows that fear and limited access to healthcare are the forces behind irrational intake of these drugs.

Stress, the pressure of exams and increased independence of students in universities are especially predisposing factors that predispose students towards self-medication. Albusalih et al. (2017) discovered that approximately half of Saudi medical students engaged in self-medication,

most of which were using analgesics and multiple vitamins. A study conducted by Gbadogo (2017) showed that Ghanaian students were 48 percent prevalent due to peer pressure and the availability of pharmacies. Equally, Azhar et al. (2013) found prevalence rate of 83.9 percent among urban Malaysians, with the most common response being, timesaving.

Comparative research in Nepal (Sharma et al., 2023) and Ethiopia (Tesfaye et al., 2020) points out the culture of self-care as a measure of maturity and responsibility as acceptable. Self-medication patterns are also influenced by gender norms in the patriarchal societies. Soroush et al. (2017) discovered that Iranian female nursing students were more prone to self-medicate because of menstrual pain because of modesty issues. This kind of evidence is like the issues in northern Pakistan where a women may be stigmatized by consulting with male doctors.

The rates of self-medication in Pakistan are relatively high, and antibiotics are frequently obtained without a prescription (Limaye et al., 2017; Awan et al., 2022). Hanif et al. (2017) provided a prevalence of 76 percent in pharmacy students in Islamabad and 95 percent of undergraduates in Karachi had self-treated at least once in six months (Zafar et al., 2008). Despite these dire statistics, not much empirical research has been done in northern Pakistan. Low health literacy, geographic isolation, gendered barriers make Gilgit-Baltistan, as compared to urban centers, the reason why the current inquiry is necessary.

3. Theoretical Framework

3.1 Bio-Psychosocial Model.

The Bio-Psychosocial Model created by Engel (1977) combines biological triggers (e.g. pain or fever), psychological perceptions (stress, anxiety, previous success with self-treatment) and social situations (peer influence, economic constraint, cultural norms). The present research also uses the Health Belief Model as the basis of understanding the role of the perceived susceptibility, severity, and barriers on self-medication behavior. These frameworks when integrated offer a comprehensive explanation of the choices made by students to treat themselves.

In this model, biological elements involve those processes and indicators that originate self-medication actions. Usual causes among pupils contain fever, headaches, tiredness, and slight infections that disturb day-to-day practices (Hughes et al., 2001). The biologic push for relief usually leads people to pursue instant clarifications through existing over-the-counter (OTC) treatments.

Additionally**,** previous positive involvements with some medicines boost biological habituation, where the body's identification of signs provokes an instinctive self-treatment reply (James et al., 2006). Areas like Gilgit-Baltistan, where inadequate healthcare amenities and prolonged travels can add surge dependance on self-medication practices (Afolabi, 2008).

Mental factors refer to those attitudes, feelings, inspirations, and sentiments inspiring health conditions. These elements also involve risk insight**,** students who underestimate the risks of drug misuse or antibiotic resistance are more likely to self-medicate (Elmahi et al., 2021; Wahab

et al., 2023). Thus, attitudes toward self-medication are shaped by both rational judgments and emotional responses to illness.

Besides mental factors, social elements that comprise household patterns, peer influence, cultural norms, and socio-economic circumstances (Shehnaz et al., 2014). In many cultures, self-medication is considered as a common and even normal conduct, exclusively while supported by peers or family heads. Moreover, economic pressure and scarcity of medical facilities in distant parts such as Diamer, Gilgit, and Baltistan urge dependence on local drugstores and casual suggestions rather than medical consultations (Kassie et al., 2018).

With the help of the Bio-Psychosocial Model, it is possible to consider the issue of self-medication among students as an adaptive mechanism to biological discomfort, psychological rationality, and the social environment (Engel, 1980; Wade and Halligan, 2017).

The point that self-medication is not just a convenient habit but a complex health behavior with many factors underlying in the combination of physical needs, mental constructs, and environmental pressures is highlighted in this integrative view. Understanding these interdependencies can be used to develop specific educational and policy interventions that will help to promote safe self-care behaviors and discourage inappropriate drug use.

4. Methodology

A quantitative cross-sectional design was adopted to estimate prevalence and identify associated factors. The study was conducted at Karakoram International University (KIU), Gilgit, the premier higher-education institution in GB with an enrollment of approximately 3 000 students from diverse valleys. Using the Krejcie and Morgan (1970) table for finite populations, a sample size of 200 was targeted; 181 completed questionnaires were returned (response rate = 90.5 %). Participants included undergraduate and postgraduate students aged 18–30 years from multiple disciplines.

Data were collected using a structured, self-administered questionnaire adapted from Ali et al. (2012) and Boateng (2009). The tool comprised five sections covering demographics, self-medication behavior, motivations, antibiotic knowledge, and attitudes. A pilot test with 15 students ensured clarity; Cronbach's $\alpha = 0.78$ confirmed internal consistency. Content validity was reviewed by three public-health experts from KIU. Participants provided verbal informed consent, were assured of anonymity, and could withdraw at any time. No identifying information was recorded.

Data were coded and analyzed using SPSS v.23. Descriptive statistics (frequencies, percentages) summarized patterns; Chi-square tests examined associations between demographics (gender, education, hometown) and behavioral variables. A p-value $< .05$ was considered statistically significant.

5. Results

This paper presents a full-scale portrait of self-medication among the students at Karakoram international University (KIU), Gilgit in terms of descriptive statistics and inferential analysis with the aim of identifying the critical trends in behavior, awareness, and structural factors.

The sample size was 181 students of different academic levels in KIU. Most of them were female (62.4%), as female involvement in higher education in northern Pakistan was on the rise. Nonetheless, this imbalance of the genders also implies that there is a chance of the lack of representation of the male views which can be addressed in future research. The highest proportion (65.2) (as shown in the table 1) was in the 21-25 year of age bracket, which fits within the general age of undergraduate university attendance and marks an age of transition, where individuals begin to gain independence, academic stress, and find independent health decision-making. Most respondents were seeking bachelor's degrees (BS; 96.1%), which suggests that a large portion of the population being studied is (i.e., undergraduate students) who tend to be left to cope with their health issues without formal training or institutional assistance. It is important to note that 97.2% of the respondents belonged to Gilgit city, which is grossly under representative of other students in remote valleys like Diamer, Baltistan and Ghizer. This geographical bias restricts externalizing and highlights the necessity of future studies to feature more geographical representation, especially considering that access issues in rural regions have increased due to healthcare concerns.

Table 1:
Demographic Profile (n=18)

Variable	Category	%	Key Insight
Gender	Female	62.4	Higher self-medication (χ^2=12.988*)
Age	21–25 years	65.2	Peak age for independent health decisions
Hometown	Gilgit	97.2	Underrepresents remote valleys
Education	BS	96.1	Critical window for health literacy

5.1 Prevalence and Patterns of Self-medication

Self-medication was very common with 74.6 percent of the students being involved in self-medication. This percentage is comparable with trends in the national level in such urban centers as Islamabad and Karachi (Hanif et al., 2017; Albusalih et al., 2017), although the geographical context in a remote and mountainous area provides insight into how structural barriers contribute to self-treatment dependency. The most likely medication was Panadol (34.3%), then there was Paracetamol (27.1%), and Ponistan (13.3%).

These painkillers were mostly consumed addressing cold and flu symptoms (58.0%), which emphasizes the impact of self-medication on over-the-counter minor and self-diagnosed diseases. Personal history and family recommendations were the primary reasons that led the students to self-medication (42.0%), implying that they pay significant attention to their past and family counsellors, instead of consulting professional counsellors.

This observation is reflected in the world literature where experiential learning is paramount in development of health behaviors (Lau et al., 1995). Worryingly, 47.0 percent of students falsely estimated that antibiotics can cure both bacteria and viruses, which also leads directly to antimicrobial resistance (AMR) - a national health priority in Pakistan (WHO, 2021). More so, 54.1% of the students reported having recommended self-medication to family or friends, which

highlights their contribution as informal health influencers capable of sustaining risky behaviors in their home communities.

Table 2:
Self-medication Patterns

Variable	Category	%
Prevalence	Self-medicate	74.6
Top Drug	Panadol	34.3
Top Condition	Cold/Flu	58.0
Top Motivation	Previous experience	42.0
Antibiotic Knowledge	"Treats viruses too"	47.0
Advises Others	Yes	54.1

5.1 Structural Drivers and key Associations

Statistically significant relationships were found between sociodemographic factors and self-medication behavior with the use of chi-square tests. The probability of female students taking Panadol was much higher (60.3) than that of the male students (31.0; kh2 = 12.988, $p < 0.05$), perhaps because female patients cannot access male doctors in cases of reproductive or menstrual problems (Gbadago, 2017). The level of higher education was significantly connected with the accurate knowledge about antibiotics: only 23% of students of BS correctly defined the antibiotics as effective only against bacterial infections whereas 75% of the students of MSc/PhD did (kh 2 = 22.490, $p < 0.01$).

This knowledge gradient indicates the role of formal education in improving pharmacological literacy, which supports the need to implement health education in curricula. The role of hometown was also significant: the students in Diamer mentioned the absence of healthcare professionals as a strong motivational factor, which was rated 66.7 percent, which is much higher than Gilgit (28.0; kh2 = 10.133, $p < 0.05$). This shows the dramatic differences between the healthcare systems of urban and remote settings, in which distance, topography, and financial barriers greatly restrict access to formal care.

In short, these results highlight picture of personal extravagance, but a picture of a system failing. Riskiness is caused by high prevalence, pernicious misconceptions, and peer pressure to a perfect storm of public health risk. However, behind the numbers lie stories of students who do not access clinics because it is too expensive, they are ashamed or too scared; they expect to use medicine that is out of date in their home cabinets; they believe they are being told by a friend to do it rather than being prescribed by a doctor. This paper demonstrates that self-medication at KIU is not a behavior-- rather a logical response to a reality in which healthcare is geographically, economically, and culturally inaccessible.

Table 3:
Key Chi-Square Associations

Association	Key Finding	χ^2	p
Gender × Drug Use	Females prefer Panadol (60.3%)	12.988	<0.05
Education × Antibiotic Knowledge	75% of MSc know vs. 23% of BS	22.490	<0.01
Hometown × Motivation	Diamer: 66.7% cite "no doctors"	10.133	<0.05

6. Discussion and Conclusion

The paper is full of information and understanding of self-medication in university students in Gilgit-Baltistan- a setting where little has been covered in literature. The 74.6% prevalence is comparable to other cities in Pakistan (Hanif et al., 2017; Limaye et al., 2017), which means that self-medication has become one of the established practices, regardless of socioeconomic and geographical factors. Nevertheless, the reasons in GB vary, as they are based on peculiarities of environment and culture.

The mountainous terrain of Gilgit-Baltistan and scattered settlements do not allow access to healthcare as in urban areas where pharmacies and clinics are accessible. Students tend to be living quite distant to hospitals of the city and use local shops to get OTC drugs. The lack of finances also contributes to this sort of behavior: the cost of consulting with a doctor privately is high, and state facilities are overstaffed. Because of this, self-medication is not only a convenience, but a survival tactic in a constrained healthcare system.

Disparities that were gendered were revealed. Women students had more self-medication rates, particularly menstrual and common pain medicine, and this finding is consistent with another study by Soroush et al. (2017) and Albusalih et al. (2017). Many women are prevented by cultural modesty to visit male doctors, and this makes them use analgesics that are readily available. This practice highlights the collaboration between gender, culture, and healthcare inequity, which is the primary focus of the public-health policy in conservative societies. Moreover, 41.4 percent of students get drugs in the local shops or supermarkets rather than the pharmacies is a regulatory disaster. In Gilgit, illegally run so-called medical shops openly sell antibiotics without prescriptions and keep them in the shelves which are exposed to sunlight. This goes against the Drug Act 1976 of Pakistan- but it is almost impossible to enforce. Students do not visit shops because they are irresponsible, they just visit them because they are available and cheap and not judgmental. The pharmacy requests a prescription, as one student said: "*The shopkeeper inquires whether I want anything more*". (BS female student)

The knowledge of antibiotics had a strong correlation with education level. The level of understanding showed more consistency in the case of postgraduate students and more prone to misunderstanding in the case of undergraduates. The lack of knowledge on health education at the university level is evidenced by the persistent nature of antibiotic misuse despite being sensitized on the issue. The introduction of non-medical curricula with pharmacology and drug-resistance awareness might be a preventive measure.

Research in the world depicts the same pattern of behavior. Sixty-eight percent of the students in Ethiopia engaged in self-medication (Tesfaye et al., 2020); seventy-one percent in India (Patil et al., 2022); and forty-nine-point three percent in Saudi Arabia (Albusalih et al., 2017). Reliance on self-treatment is enhanced, meanwhile, in GB, by geographic isolation. Moreover, the sociocultural factors such as the role of family and the dependency on the community pharmacy reflect the trends in the rural African and Middle Eastern areas (Gbadago, 2017; Kazemioula et al., 2022).

Self-medication may seem to be harmless, but it can cover hidden diseases and encourage antibiotic resistance (O'Neill, 2016). The results that almost fifty percent of students are abusing antibiotics are indicators of a possible crisis in the field of public-health. Habitual self-medication is psychologically dangerous as it contributes to overconfidence in non-professional judgment,

which creates addiction and postpones timely medical care. Theoretically, the Bio-Psychosocial Model proposed by Engel can be a very appropriate explanation of the multidimensional nature of the factors that precipitate this behavior- biological (pain, fever), psychological (stress, autonomy), and social (peer influence, gender norms). Such interrelated layers influence decision-making and recycle informal care-seeking.

To reduce these challenges, it is proposed to implement the following multi-level interventions: Incorporate work on rational use of drugs, antibiotic resistance and first-aid training in orientation sessions and semester courses. Implement prevailing legislations that mandate antibiotic prescriptions, which should be given by pharmacists to the purchasers. Although, KIU has one female doctor at the campus however, more university-based clinics or telehealth units where people can consult without charges, especially those who are not ready to visit other clinics especially the females need to be considered. Moreover, work with local health departments to come up with awareness campaigns on local languages. Elders and religious leaders in the community can also be useful in destigmatizing medical consultation. Use local media campaigns and social media to create awareness of antibiotic resistance and adequate medication practices, by building on the media-literacy background of the students.

This paper builds on the Bio-Psychosocial framework by showing how geographical distance contributes to psychosocial and economic disadvantages. It proposes a theoretical connection between structural marginalization and health autonomy, which add to the behavioral medicine and communication studies in the developmental context. The KIU students' self-medication is not a matter of negligence, but it relies on structural healthcare restrictions and sociocultural norms. The outcome of this study may urge policymakers to contemplate on self-medication practice, not just as a botch in behavior, but as an indicator of systemic failure. This problem needs concerted efforts in education, regulation, and community involvement to address it. Increasing health literacy among the young adults, especially women, can greatly decrease the use of inappropriate drugs and help in the world to control global antimicrobial-resistance.

The cross-sectional design of this study does not allow causal inference. The data can be self-reported which could result in social-desirability and recall bias. The sample is limited to a single university and might not include the whole GB students. The behavioral change over time needs to be studied using mixed methods and longitudinal designs in future studies. These findings would be further supported and generalized by comparative research among other universities and community populations in the north.

References

Abbas, E., Gul, R., & Hussain, A. (2024). *Prevalence of self-medication and assessment of its consequences on health among female university students in Islamabad, Pakistan. Proceedings of the Pakistan Academy of Sciences: B. Life and Environmental Sciences.* https://doi.org/10.53560/ppasb(61-4)942

Afolabi, A. O. (2008). Factors influencing the pattern of self-medication in an adult Nigerian population. *Annals of African Medicine, 7*(3), 120–127. https://doi.org/10.4103/1596-3519.55666

Albusalih, F. A., Naqvi, A. A., Ahmad, R., Ahmad, N., & Alfouzan, K. (2017). *Prevalence and factors associated with self-medication among university students in Saudi Arabia. Journal of Pharmaceutical Health Services Research, 8*(4), 314–318. https://doi.org/10.1111/jphs.12187

Ali, A., et al. (2012). *Self-medication practices in developing countries: A review. Journal of Pharmacology and Clinical Research, 2*(1), 45–52.

Asif, R., Hassan, U., Jafffry, T., Shan, H., Zulfiqar, R., & Tabassum, H. (2023). Perceptions and Attitudes Regarding Self-Medication among Undergraduate Students of Islamabad. Pakistan Journal of Public Health. https://doi.org/10.32413/pjph.v13i3.1157.

Awan, T., Khalid, F., & Zaidi, M. (2022). *Self-medication practices among business students in Karachi. Online Türk Sağlık Bilimleri Dergisi.* https://doi.org/10.26453/otjhs.1026267

Azhar, S., Gunasekaran, S., Kadirvelu, A., Gurtu, A., Sadasivan, S., & Kshatriya, G. K. (2013). Self-medication practices among urban Malaysian adults. Journal of Pharmacy and Bioallied Sciences, 5(3), 220–225. https://doi.org/10.4103/0975-7406.113316

Barros, E. J., Tavares, D. Q., & Bertoldi, A. D. (2009). Self-medication in the adult population of Pelotas, Southern Brazil. Revista de Saúde Pública, 43(1), 1–9. https://doi.org/10.1590/S0034-89102009000100001

Bert, F., Previti, C., Calabrese, F., Scaioli, G., & Siliquini, R. (2022). *Antibiotics self-medication among children: A systematic review. Antibiotics, 11*(11), 1583. https://doi.org/10.3390/antibiotics11111583

Bollu, M., Reddy, K., & Kumar, P. (2014). *Patterns of self-medication among medical students in India. Journal of Clinical and Diagnostic Research, 8*(12), HC14–HC17.*

Darke, S. (2013). *Pathways to heroin dependence: Time to re-appraise self-medication. Addiction, 108*(4), 659–667. https://doi.org/10.1111/add.12065

Domingues, P. H. F., Galvão, T. F., de Andrade, K. R. C., Araújo, P. C., Silva, M. T., & Pereira, M. G. (2017). Prevalence of self-medication in Brazil: Systematic review and meta-analysis. Revista de Saúde Pública, 51, 62. https://doi.org/10.1590/S1518-8787.2017051006872

Elmahi, O., Musa, R., Shareef, A., Omer, M., Elmahi, M., Altamih, R., Mohamed, R., & Alsadig, T. (2021). Perception and practice of self-medication with antibiotics among medical students in Sudanese universities: A cross-sectional study. *PLoS ONE, 17*. https://doi.org/10.21203/rs.3.rs-260575/v1.

Engel, G. L. (1977). *The need for a new medical model: A challenge for biomedicine. Science, 196*(4286), 129–136. https://doi.org/10.1126/science.847460

Engel, G. L. (1980). The clinical application of the biopsychosocial model. *American Journal of Psychiatry, 137*(5), 535–544. https://doi.org/10.1176/ajp.137.5.535

Gashaw, T., Yadeta, T., Weldegebreal, F., Demissie, L., Jambo, A., & Assefa, N. (2025). *The global prevalence of antibiotic self-medication among the adult population: Systematic review and meta-analysis. Systematic Reviews, 14*(1), 2783–2795. https://doi.org/10.1186/s13643-025-02783-6

Gbadago, G. (2017). Factors influencing self-medication among students at the University of Ghana, Legon. Journal of Pharmaceutical and Allied Sciences, 14(2), 2210–2220.

Gbadago, G. (2017). Factors influencing self-medication among students at the University of Ghana, Legon. Journal of Pharmaceutical and Allied Sciences, 14(2), 2210–2220.

Geissler, P. W., Nokes, K., Prince, R. J., Achieng, R. O., Aagaard-Hansen, J., & Ouma, J. H. (2000). Children and medicines: Self-treatment of common illnesses among Luo school children in western Kenya. Social Science & Medicine, 50(12), 1771–1783.https://doi.org/10.1016/S0277-9536(99)00417-9

Graziano, A. M., & Raulin, M. L. (2013). Research methods: A process of inquiry (8th ed.). Pearson.

Hanif, A., et al. (2017). *Self-prescription of antibiotics among pharmacy students at Hamdard University, Islamabad. Pakistan Journal of Pharmaceutical Sciences*

Hughes, C. M., McElnay, J. C., & Fleming, G. F. (2001). Benefits and risks of self-medication. *Drug Safety, 24*(14), 1027–1037. https://doi.org/10.2165/00002018-200124140-00002

Kassie, A. D., Bifftu, B. B., & Mekonnen, H. S. (2018). Self-medication practice and associated factors among adult household members in Meket District, Northeast Ethiopia, 2017. *BMC Pharmacology and Toxicology, 19*(1), 15. https://doi.org/10.1186/s40360-018-0205-6

Kazemioula, G., Golestani, S., Alavi, S., Taheri, F., Gheshlagh, R., & Lotfalizadeh, M. (2022). *Prevalence of self-medication during COVID-19 pandemic: A systematic review and meta-analysis. Frontiers in Public Health, 10,* 1041695. https://doi.org/10.3389/fpubh.2022.1041695

Kotwani, A., Joshi, J., & Lamkang, A. (2021). Over-the-Counter Sale of Antibiotics in India: A Qualitative Study of Providers' Perspectives across Two States. Antibiotics, 10. https://doi.org/10.3390/antibiotics10091123.

Lau, G. S. N., Lee, K. C. K., & Luk, C. T. (1995). Self-medication among university students in Hong Kong. Asia-Pacific Journal of Public Health, 8(1), 50–53. https://doi.org/10.1177/101053959500800111

Laxminarayan, R., Van Boeckel, T., & Teillant, A. (2023). The economic costs of withdrawing antimicrobial growth promoters in the livestock sector in Pakistan. The Lancet Planetary Health, 7(1), e45–e56. https://doi.org/10.1016/S2542-5196(22)00315-9

Limaye, D., Saeed, F., Ahmad, M., Pitani, R., & Fortwengel, G. (2017). *Self-medication practices among university students from Karachi, Pakistan. International Journal of Community Medicine and Public Health, 4,* 3076–3081. https://doi.org/10.18203/2394-6040.IJCMPH20173635

O'Neill, J. (2016). *Tackling drug-resistant infections globally: Final report and recommendations.* The Review on Antimicrobial Resistance.

Primary Healthcare (PHC) Gilgit-Baltistan. (2023). Annual health facilities report 2022–2023. Government of Gilgit-Baltistan.

Sachdev, C., Anjankar, A., & Agrawal, J. (2022). Self-Medication With Antibiotics: An Element Increasing Resistance. Cureus, 14. https://doi.org/10.7759/cureus.30844.

Shah, S., Ahmad, H., Rehan, R., Najeeb, S., Mumtaz, M., Jilani, M., Rabbani, M., Alam, M., Farooq, S., & Kadir, M. (2014). Self-medication with antibiotics among non-medical university students of Karachi: a cross-sectional study. BMC Pharmacology & Toxicology, 15. https://doi.org/10.1186/2050-6511-15-74.

Sharma, A., Paudyal, V., & Luitel, N. P. (2023). Self-medication in remote mountain communities: A comparative study of Nepal and Pakistan. The Lancet Regional Health – Southeast Asia, 12, 100287. https://doi.org/10.1016/j.lansea.2023.100287

Shehnaz, S. I., Agarwal, A. K., & Khan, N. (2014). A Systematic Review of Self-Medication Practices among Adolescents. *Journal of Adolescent Health*, *55*(4), 467–483. https://doi.org/10.1016/j.jadohealth.2014.07.001

Soroush, A., Abdi, A., Andayeshgar, B., Vahdat, A., & Khatony, A. (2017). Exploring the perceived factors influencing self-medication among nursing students: A qualitative study. BMC Nursing, 16(1), 1–8. https://doi.org/10.1186/s12912-017-0252-2

Soroush, A., Zargarzadeh, A., & Mehralian, G. (2017). *Gender differences in self-medication behavior among Iranian students. Iranian Journal of Public Health, 46*(3), 389–396.

Sunny, T., Jacob, R., K, K., & Varghese, S. (2019). Self-medication: Is a serious challenge to control antibiotic resistance?. National Journal of Physiology, Pharmacy and Pharmacology. https://doi.org/10.5455/NJPPP.2019.9.0620508062019.

Tena, D. (2014). Prevalence of self-medication among university students in Addis Ababa, Ethiopia. Ethiopian Journal of Health Development, 28(2), 106–112.

Tesfaye, Z. T., Ergena, A. E., & Yimer, B. T. (2020). Self-medication practice and associated factors among health care professionals in Ethiopia. BMC Health Services Research, 20(1), 1–9. https://doi.org/10.1186/s12913-020-05397-7

Wade, D. T., & Halligan, P. W. (2017). The biopsychosocial model of illness: A model whose time has come. *Clinical Rehabilitation, 31*(8), 995–1004. https://doi.org/10.1177/0269215517709890

Wahab, A., Alam, M. M., Hasan, S., Halder, S., Ullah, M. O., & Hossain, A. (2023). Exploring the knowledge, practices & determinants of antibiotic self-medication among bangladeshi university students in the era of COVID-19: A cross-sectional study. *Heliyon*, *9*(9), e19923. https://doi.org/10.1016/j.heliyon.2023.e19923

World Health Organization. (1998). *The role of the pharmacist in self-care and self-medication: Report of the 4th WHO consultative group on the role of the pharmacist.* Geneva: WHO.

Yeamans, C., Li, H., & Pereira, S. (2024). *Post-pandemic trends in self-medication: A global review. Public Health Frontiers, 12,* 1452–1468. https://doi.org/10.1016/j.puh.2024.03.008

Yeamans, S., Gil-De-Miguel, Á., Hernández-Barrera, V., & Carrasco-Garrido, P. (2024). Self-medication among general population in the European Union: prevalence and associated factors. European Journal of Epidemiology, 39, 977 - 990. https://doi.org/10.1007/s10654-024-01153-1.

Zafar, S., Syed, R., Waqar, S., Zubairi, A., Vaqar, T., Shaikh, M., Yousaf, W., Shahid, S., & Saleem, S. (2008). Self-medication amongst university students of Karachi: prevalence, knowledge and attitudes. JPMA. *The Journal of the Pakistan Medical Association*, 58 4, 214-7