Original Article

Self-Medication Practices among Health Professional Students during the COVID-19 Pandemic: A Cross-Sectional Study in Lahore

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Abstract

Background: Self-medication is a global concern, particularly among health professional students who have easier access to medical knowledge.

Objective: The main objective of this study was to assess the frequency of self-medication among health professional students and to compare the frequencies between COVID-19 positive individuals and patients having flu-like symptoms during the pandemic.

Methodology: A descriptive cross-sectional study was conducted among 380 health professional students from various medical and dental colleges in Lahore. Response rate was 65.3%. Survey was administered via google forms and included sections containing questions about participants' history of self-medication. Both COVID-19 affected and unaffected participants were asked about their history or tendency toward self-medication.

Results: Results reported that 58.57% participants with COVID-19 and 63.47% with flu-like sickness gave a positive response about self-medication. 80.49% COVID-19 individuals and 78.30% with flu-like sickness claimed that self-medication helped with the symptoms.

Conclusion: Self-medication was highly prevalent among health professional students during the pandemic, driven by easy access to over-the-counter drugs, prior experiences, and reluctance to consult physicians. This practice underscores the urgent need for targeted awareness programs and stricter regulatory strategies.

Keywords: Self-Medication, COVID-19, Health Professional Students, Pandemic

Introduction

Self-medication implies the use of drugs without prescription from a licensed doctor. Prophylactic self-medication can lead to unfavorable consequences such as microbial resistance and addiction.[1] With self-medication, the individual is entirely responsible for any undesirable effects that might occur.[2] Delayed seeking of professional guidance due to self-medication masks the relevant signs of any underlying disease and may lead to adverse pharmacodynamic interactions.[3] In Pakistan, during the COVID-19 pandemic, an increased trend of self-medication was observed. The non-availability of COVID-19 treatment, unawareness and fear of the pandemic led to excessive hoarding of medicines for future use during the pandemic.[4]

Self-medication is an important public health issue all over the world with a particularly high percentage in Pakistan, around 84%. The main source of self-

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medication include the easy availability of drugs without prescription at pharmacies and recommendations from friends or relatives.[1] Evaluation of self-medication practices is important to understand perceptions and to plan strategies of discouraging it in the future.[5] The aim of this study was to assess how the COVID-19 pandemic affected the trends of self-medication among health professional students in Pakistan. Studying health professional students is important as their medical know-ledge and influence on community health behaviors may both encourage rational use and increase the risk of misuse. Data on self-medication practices among students in Lahore remain scarce, with very few studies specifically addressing this issue during the COVID-19 pandemic.

Methodology

A cross-sectional descriptive study was performed using a convenience sampling technique over a duration of six months, after approval from the Institutional Review Board.

Ethical Consideration:

Ethical review of the study was conducted by the Ethical Review Committee (ERC) at Rahbar Dental College (No. 37/RCoD/ERC/03/2024, dated: 30-09-2024). For data collection, participation from students was voluntary, and unwillingness to participate was taken as non-verbal refusal to take part in the study.

The study population comprised undergraduate health professional students in Lahore. Data was collected from various medical and dental colleges in Lahore. Convenience sampling could introduce selection bias and limit the generalizability of the findings. However, this approach was the most practical, as it allowed to reach enough students quickly and efficiently through online platforms. While random sampling would have provided stronger generalizability, convenience sampling ensured timely data collection. The sample size was 380 students from various medical and dental colleges. The WHO calculator was used to calculate the sample size with a confidence level ($1–\alpha = 95\%$), anticipated population proportion ($p = 0.50$), and absolute precision ($d = 0.05$).[6] $n = ([Z(1–\alpha/2)]^2 \times P(1–P))/d^2$

Inclusion Criteria: The age group ranged from 18 to 26 years, including both genders, who were able to comprehend the english language and who provided consent to participate.

Exclusion Criteria: Exclusion criteria included faculty members and individuals with systemic illnesses (e.g., diabetes, cardiovascular disease, chronic respiratory disorders, or other long-term conditions) to avoid confounding factors that could influence self-medication practices.

A questionnaire was used as the study tool, designed on Google Forms. The questionnaire consisted of twenty-nine questions divided into three sections. The first section comprised demographic details, including age, gender, field of study, and presence or absence of COVID-19 infection in the past. The second section was meant for participants who had a positive history of COVID-19 infection since the start of the pandemic. This section assessed the symptoms, severity of the disease, and type of drugs utilized. The third section was meant for participants with a history of flu-like illness other than COVID-19 since the pandemic started. It included the symptoms of the disease and medicines that were utilized, paracetamol, painkillers, antibiotics, antivirals, antiallergics, multivitamins, steroids, antimalarials, and inhalers/nebulizers, and the reasons that influenced self-medication, such as internet use, prior experience in treating similar symptoms, recommendations from someone who had similar symptoms, advice from a pharmacist, easy availability of over-the-counter drugs, and duration of recovery. An average student took approximately three minutes to complete the form.

The reliability of the questionnaire was checked through a pilot study, which yielded a Cronbach's alpha value of 0.77, and the validity was assessed by five expert faculty members. Participants were approached on whatsApp to fill out the questionnaire. This approach was particularly convenient, enabling quick dissemination of the form to the target population and allowing participants to complete it comfortably on their devices.[7] It also comprised a written consent section at the start, along with the purpose of the study. All participants were assured of absolute confidentiality and anonymity. The response rate was 65.3%.

Statistical Analysis:

Data was entered and analyzed using SPSS version 22. Normality of the data was checked by Shapiro Wilk's test. Descriptive statistics, including frequencies, were calculated, and the Chi-square test of association was applied.

Results

The questionnaire was sent to 380 participants, out of

which 248 responded (response rate: 65.3%). Demographic information is given in Table I. Among them,

Table I: *Demographic information of the participants*

		n(%)
Age Groups (in Years)	≤20	121(48.8)
	21-30	123(49.6)
	31-40	2(0.8)
	>40	2(0.8)
Gender of Participants	Male	72(29)
	Female	176(71)
Field of Study	MBBS	55(22.2)
	BDS	152(61.3)
	AHS	41(16.5)

n = sample size, Bachelor of Dental Surgery (BDS), Bachelor of Medicine & Bachelor of Surgery (MBBS), Allied Health Sciences (AHS).

25.5% were 18–19 years old, and 72.07% were 20–24 years old. There were 70.97% females and 29.03% males in the sample. There were 61.29% Bachelor of Dental Surgery (BDS) students, 22.18% Bachelor of Medicine and Bachelor of Surgery (MBBS) students, and 16.53% Allied Health Sciences (AHS) students.

Among the surveyed population, 28.22% had a history of COVID-19 infection since the start of the pandemic. Among them, 58.57% had a positive COVID-19 report, while 41.43% did not undergo COVID-19 screening. Of those who were declared infected with COVID-19, 81.43% had a symptomatic episode once, whereas 18.57% reported more than one episode of infection. 38.57% reported mild symptoms during the infection, 55.71% reported moderate symptoms, while 5.71% reported a severe infection. Participants also responded to questions about the symptoms they experienced. Figure I demonstrates all the symptoms reported by COVID-19 positive individuals along with their percentages. It shows that the most prevalent symptoms were fever, headache, muscle pain, and cough, in that order. 47.14% of them visited a doctor for treatment, while 52.86% did not. Results showed that 58.57% of participants gave a positive response regarding self-medication, whereas 41.43% did not report any self-medication.

Those who self-medicated reported that 87.80% had prior exposure to COVID-19 infection, whereas 12.20% gave a negative response to this. Figure II demonstrates which drugs were prescribed by doctors to COVID-19 patients and which drugs were used for self-medication by COVID-19 individuals. Paracetamol was the most commonly prescribed drug as well as the most commonly used for self-medication. Interestingly, antibiotics were the second most prescribed drug, even though COVID-19 is a viral and not a bacterial disease.

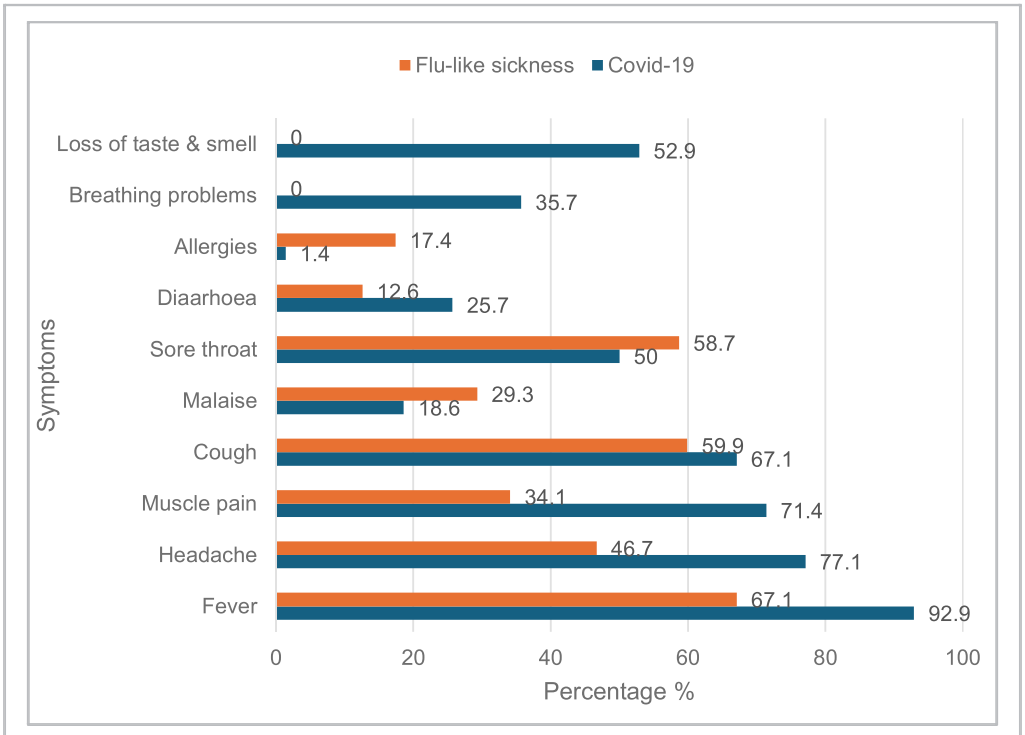

Figure I: *Self-reported Symptoms of COVID-19 and Flu-like Illness*

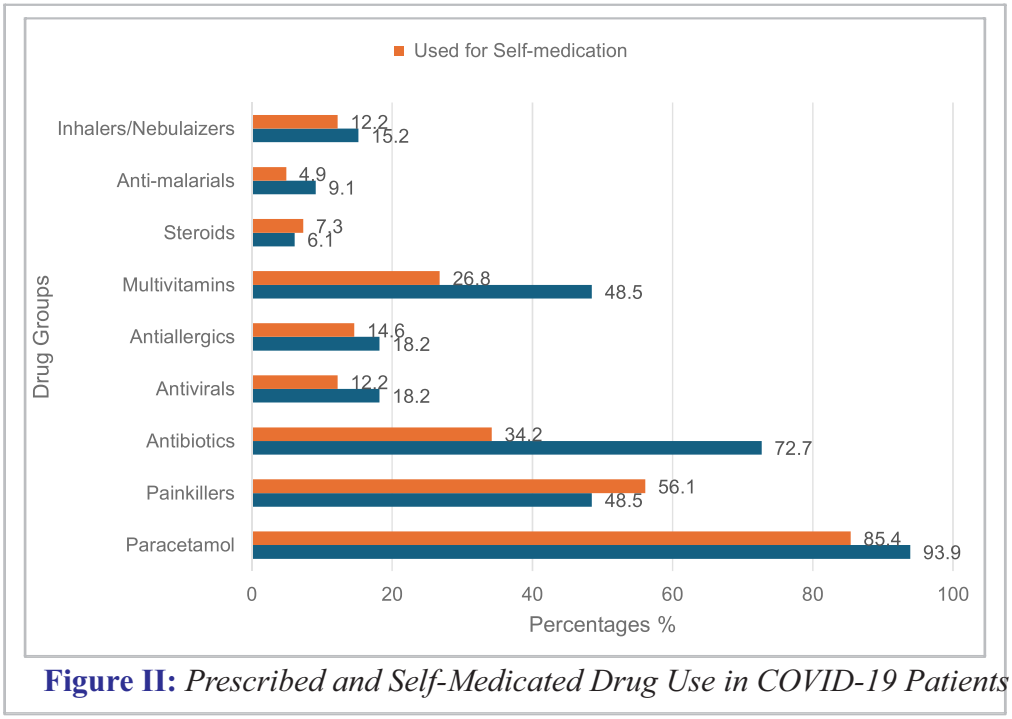

Figure II: *Prescribed and Self-Medicated Drug Use in COVID-19 Patients*

A majority (80.49%) claimed that self-medication helped relieve their symptoms, whereas 19.51% mentioned reduced effectiveness. Participants also responded about the duration of recovery after self-medication: 43.90% recovered in less than seven days, 46.34% in 7–14 days, and 9.76% took more than fourteen days to recover.

Among the participants, 67.33% reported having experienced flu-like sickness since the start of the pandemic. 57.49% of them had not taken a COVID-19 test when they were sick, while 42.51% took a test to rule out COVID-19. These participants were also asked about the symptoms they experienced. These are displayed in Figure I, along with a comparison between the symptoms experienced by individuals with COVID-19 and those with flu-like sickness according to the frequencies in the respective groups. The most frequent symptoms in the flu-like sickness group were fever, cough, and

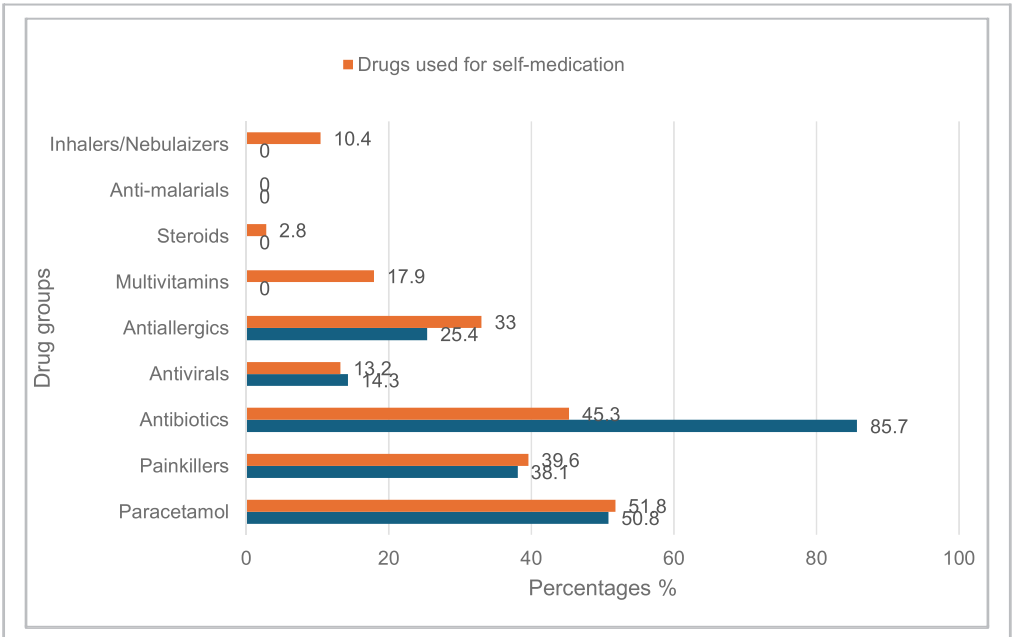

Figure III: *Prescribed and Self-Medicated Drug Use Among Individuals With Flu-like Symptoms*

Table II: *Association of Self-Medication Practices With COVID-19 and Flu-like Illness*

		Self Medication		Total
		No	Yes	
Groups	Flu-like sickness	61	106	167
	COVID-19	29	41	70
Total		90	147	237

Chi Square Test(χ^2) =0.503, p-value = 0.478, p value < 0.05 considered significant

sore throat, in descending order. 37.72% consulted a doctor for flu, whereas 62.28% did not. Those who consulted a doctor reported the drugs that were prescribed to them, i.e., antibiotics, paracetamol, painkillers, and antiallergics. In the flu-like sickness group, 63.47% reported self-medication, while 36.53% did not. Figure III provides a clearer view of all the drugs that were prescribed, along with those used for self-medication by individuals with flu-like sickness, together with their percentages. 78.30% reported that self-medication helped with their symptoms. Regarding the recovery duration of participants on self-medication, 79.25% recovered in less than seven days, 18.87% took 7–14 days, while 1.89% took more than fourteen days.

Participants were also questioned about what influenced them to self-medicate. Figure IV presents all the reasons for self-medication provided by COVID-19 and flu-like sickness individuals. Prior experience in treating similar symptoms and suggested medicines by a relative or friend who had been treated for similar symptoms were the two most common reasons leading to self-medication in both groups.

Chi-square test of association was applied to compare COVID-19 and flu-like sickness groups on the basis of self-medication, as shown in Table II. The p-value was statistically non-significant (0.478).

Discussion

In this cross-sectional descriptive study carried out on 380 students from various medical and dental colleges, the most common reason for self-medication among COVID-19-positive patients was the prior experience of someone who had COVID-19 (56.1%). The most common reason reported for self-medicating during a flu-like sickness was previous personal experience to treat similar symptoms (64.15%). This finding is in accordance with a study conducted on university students in Karachi that also identified prior experience in treating similar symptoms as the main reason behind self-medication.[8] A study conducted in Nigeria reported that people opted for self-medication for COVID-19 prevention and treatment due to fear of discrimination in hos-pitals, fear of quarantine, unavailability of COVID-19 drugs and delay in receiving treatment.[9] Similar factors contributed to self-medication in Pakistan as well. In this sample the internet influenced 21.95% of the participants in their decision to self-medicate during COVID-19 infection and 56.1% of participants reported self-

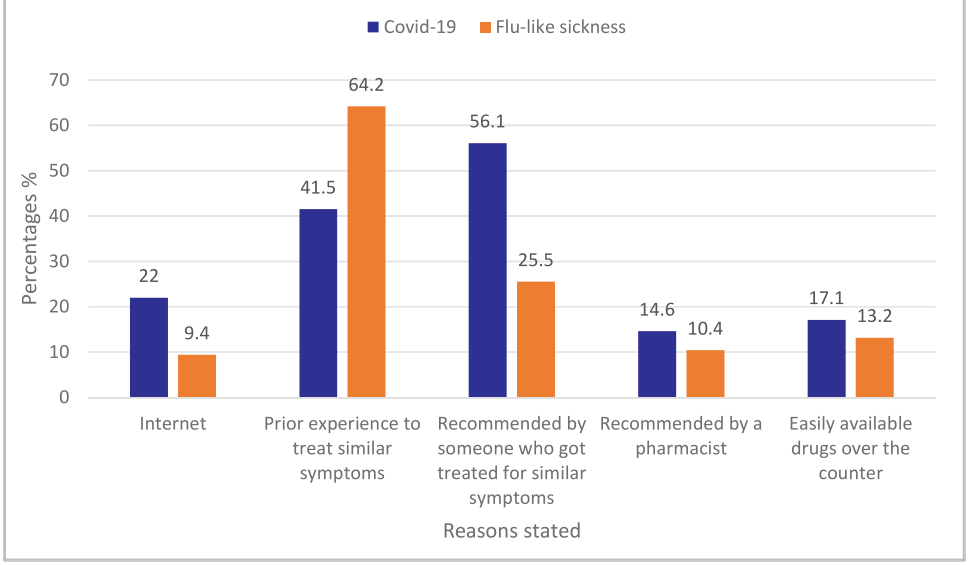

Figure IV: *Reported Reasons for Self-Medication During COVID-19 and Flu-like Illness*

medicating with painkillers. A research paper from Lahore also reported painkillers as the most frequently used drugs for self-medication. It further highlighted the internet's role in providing treatment options, as well as people's fear of contracting COVID-19 at hospitals and the ease of obtaining over-the-counter drugs.[10]

A study from Multan on self-treatment practices during COVID-19 reported that 53.6% of the participants self-medicated with painkillers, 13% used antipyretic pills, 11.6% used anti-tussive, 5.8% used anti-allergy medications and 5.8% used antibiotics.[11] In this sample, among those who self-medicated, 56.1% used painkillers, 85.37% used antipyretics, and 34.15% used antibiotics. Although the percentage of participants who were self-medicating with painkillers was considerably similar, significantly higher percentages of self-treatment with antipyretics and antibiotics were reported in our sample. In this sample, 85.37% of those who had COVID-19 self-medicated with paracetamol. Self-prescription of paracetamol in such high numbers was also reported in another study from Pakistan, where 54.9% chose paracetamol for fever experienced during COVID-19 infection.[12] The most prevalent symptoms among COVID-19 patients were fever (92.8%), headache (77.14%), muscle pain (71.42%), cough (67.14%) and flu (60%) in the respective order. Another study from Pakistan reported fever (86.6%), cough (85.05%), fatigue and dyspnoea to be the most common symptoms among COVID-19 patients.[13] Similar results were reported in a study from Karachi, where the common symptoms prompting self-medication during COVID-19 were fever (67.9%), muscle pain (54.0%), fatigue (51.7%), sore throat (46.6%), and cough (44.4%).[14] A study from Multan concluded that body aches (40.6%) , fever (17.4%) and cough (10.14%) were the most reported symptoms leading to self-medication during COVID-19.[11]

COVID-19 testing among females was less common compared to males which led to a conclusion that more males were affected by the disease although there was a gender bias.[15] In our sample, among those who reported a COVID-19 infection, only 34.3% were males and 65.7% were females. This disparity may be because the majority of the health professional students in Pakistan are females. However, among the COVID-19–positive individuals in our study, most males underwent a COVID-19 test, while many infected females did not get tested. According to the data collected, 94.28% of the participants who contracted COVID-19 experienced a mild to moderate infection. Similarly, a study conducted on COVID-19 patients in Pakistan reported that 87.6% of the patients had a mild to moderate infection.[16] The magnitude of self-medication among COVID-19 individuals in the present study was 58.57%. The findings align with those of a previous investigation, which reported a prevalence of 53%.[16] Other regional and international studies have also documented high rates of self-medication during the COVID-19 pandemic. For example, research from Bangladesh reported a prevalence of 71.4%, whereas a study conducted in Togo found a comparatively lower rate of 74.2%. These variations highlight how self-medication practices differed across populations during the pandemic, with Bangladesh showing notably higher prevalence and Togo comparatively lower levels.[17,18]

In the current study, 72.73% of the individuals infected with COVID-19 were prescribed antibiotics. The findings are similar to a survey conducted on COVID-19 patients in several hospitals of Punjab, where it was found that antibiotics were prescribed to 88.1% of the COVID-19 patients even without any diagnosis of any bacterial co-infection. The most frequently prescribed antibiotic was azithromycin either due to the experiences of the physicians in treating respiratory infections using azithromycin or due to its widespread use for the treatment of COVID-19 in other countries.[16] Third world countries like Pakistan are likely to suffer more from antimicrobial resistance (AMR) due to the misuse of antibiotics in COVID-19 infections.[19,20]

Conclusion

More than half of the health professional students in Lahore reported self-medicating during the COVID-19 pandemic, with paracetamol, painkillers, and antibiotics being the most common drugs used. The widespread practice, largely influenced by prior experiences, fear, and easy drug availability, underscores the need for stricter regulation of over-the-counter drugs and awareness programs targeting medical and dental students to mitigate future risks such as antimicrobial resistance.

Limitation and Recommendations:

Limitations of the study include that the sample size was only from the city of Lahore. Convenience samp-ling was used, which reduces generalizability. There is also a possibility of recall bias or self-reporting bias among the population. The information was collected when COVID-19 was still active, so the response from the population might be different now, as the fear of COVID-19 may have diminished. Further research is therefore recommended to explore other factors, along with the implementation of improved health policies for the timely management of such emergencies.

Conflict of interest: None

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Author Contributions:

All authors have approved the final version of the manuscript and are responsible for integrity of the study.

MA contributed to conception and design; data acqui-sition, interpretation and analysis; drafted the manu-script.

WJ contributed to design; data acquisition, interpreta-tion and analysis; revision the manuscript.

HZR contributed to conception and design; data inter-pretation and analysis; Critically revised the manuscript and gave the final approval.

MNS contributed towards analysis and interpretation of the results; critically revised the manuscript.