



ISSN:

2542-2758 (Print) 2542-2804 (Online)

ARTICLE INFO:

Received Date: July 21, 2025

Accepted Date: September 18, 2025

Published Date: December 31, 2025

KEYWORDS:

self-medication, prevalence, pattern, COVID-19.

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Access the article online



DOI: 10.62065/bjhs722

CITATION:

Yadav B, Yadav AK, Rai P. Prevalence and pattern of self-medication among COVID-19 infected students of Birat Medical College Teaching Hospital. 2025; 10 (3): 53-59.

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Prevalence and pattern of self-medication among COVID-19 infected students of Birat Medical College Teaching Hospital

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ABSTRACT

Introduction: Self-medication is a common practice in Nepal. It provides a ready low-cost alternative for people in low and middle-income country like Nepal. During the pandemic, the growing influence of social media, accessibility of over-the-counter medications, and fear of contracting the virus may have led to self-medication practices among the public. Medical students are prone to such practices due to relevant background knowledge, and access to drugs. This study was carried out to determine the prevalence, pattern, sources, and impact of self-medication practice among medical students of Birat Medical College-Teaching Hospital.

Methodology: A cross-sectional study was conducted online among 200 students of Birat Medical College-Teaching Hospital, Nepal from December 2021 to May 2022, to explore the prevalence, pattern and source of self-medication practices and the reasons to use. Ethical approval was obtained from institutional review committee of BMCTH, and verbal consent was taken from each participant before data collection. Descriptive statistics as frequency, percentage and graphs were used to analyze the collected information.

Results: Though 200 participants were enrolled in the study, only 155 (77.5%) completely filled the form and submitted. Majority of the respondents 84(54.2%) were males and higher numbers were in 18–24 years age group. Out of 155 respondents, 102 (65.8%) were infected with COVID-19. The prevalence of self-medication was 30.2% among COVID-19 infected students in this study. Self-medication practice did not differ significantly between male and female students. The most commonly used medications were Paracetamol 29 (18.7%), Azithromycin 13(8.4%), Ibuprofen 12(7.7%), and Vitamin C 11 (7.0%). The most frequently reported ailments were fever 33 (21.3%), body ache 26(16.8%) and sore throat 20 (12.9%). About 60 respondents (38.7%) took medications when they developed symptoms of COVID-19. Pharmacies 30(19.3%) were the main source of drugs. Paracetamol was the most commonly used drug for self-medication.

Conclusion: This study identified that the main drugs used during COVID-19 outbreak was Paracetamol 29 (18.7%) and Azithromycin 13(8.4%). If not used carefully, self-medication can lead to risks of developing antibiotic resistance, adverse drug reactions and financial loss. Efforts should be done to educate the advantages and disadvantages of self-medication along with its proper use.

Introduction

According to the WHO definition, self-medication is the use of drugs to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed drug for chronic or recurrent diseases or symptoms.¹

Self-medication is a common practice in developing countries like Nepal. Factors

responsible for self-medication include socio-economic status, lifestyle, high cost of hospital treatment, ready access to drugs, increased potential to manage certain illnesses through self-care, advice from friends, media and greater availability of medicinal products.² Although the WHO stressed that rational self-medication practice helps the prevention and treatment of some minor pathological conditions at affordable cost; otherwise, it may cause wastage of resources, resistance to pathogens, and serious health hazards with adverse drug reactions and prolonged morbidity.³ The prevalence of self-medication was significantly higher among Nepalese as compared to Indians.⁴ Self-medication among medical students is more common because they may have better knowledge about diseases and greater access to medicine.⁵

The COVID-19 was declared a pandemic by the World Health Organization on 30th January, 2020.⁶ As of 11th August 2022, the global crises have affected 585,086,861 individuals and claimed 6,422,914 lives.⁷ The disease varies in its symptoms, ranging from asymptomatic to severe, life-threatening conditions. The mild symptoms include cough sore throat fatigue, fever and the severe symptoms include difficulty breathing, chest pain and confusion.⁸

Patients with severe or worsening COVID-19 symptoms often required hospitalization, with some needing intensive care and others succumbing to the disease, and most hospitalized patients exhibited hypoxia, respiratory acidosis, lung opacities or infiltrates on imaging, and elevated inflammatory markers.⁹

Drugs such as antimicrobials (azithromycin, doxycycline), anti-parasitic (ivermectin), anti-malarial (hydroxychloroquine) were used to treat COVID-19, but they were soon labeled controversial as randomized studies depicted an increased risk-to-benefit ratio. However, rapid medical research has developed, and massively rolled out COVID-19 vaccines prevented the symptoms of the disease in affected individuals.¹⁰ Nepal experienced the third wave of the pandemic during the study. As of August 2022, 71.6% of population of Nepal is fully vaccinated against Covid-19.¹¹

The objective of this study was to determine the prevalence of self-medication practices among medical students of BMCTH for relief from symptoms, from the onset of first COVID-19 symptom or in case of being positively tested for COVID-19. We further assessed the self-medicated drugs used for respiratory problems, headache, body ache and diarrhoea during the pandemic. A secondary aim was to evaluate the factors associated with self-medication of various drugs among medical students of BMCTH during the COVID-19 pandemic.

Methodology

This cross-sectional web-based study was conducted among medical students of BMCTH, Nepal during COVID-19 pandemic from December 2021 to May 2022. In total 200 students were enrolled in the study, however only 155 submitted the fully filled up questionnaire. The sample size was calculated by using Cochran's formula, taking the reference prevalence of 30.3%.¹²

$$\begin{aligned} \text{Sample size (n)} &= \frac{Z^2 pq}{d^2} \\ &= \frac{1.96^2 \times 0.303 \times 0.697}{(0.05)^2} \\ &= \frac{3.8416 \times 0.303 \times 0.697}{0.0025} \\ &= 325 \end{aligned}$$

Since, we have fixed / finite population

$$\begin{aligned} \text{Then corrected sample size (n}_1\text{)} &= \frac{n}{1 + \frac{n}{N}} \\ &= \frac{325}{1 + \frac{325}{200}} \\ &= \frac{325}{\frac{525}{200}} \\ &= 184.65 \\ &= 185 \end{aligned}$$

The questionnaire was developed in English using Google survey, and distributed through email among the participants. Although the minimum required sample size was calculated to be 185, a total of 200 students were enrolled to account for possible non-response or incomplete submissions. Inclusion criteria: All undergraduate medical students (MBBS) of BMCTH who were enrolled during the study period, had access to the internet and an institutional email account, and gave informed consent to participate in the survey were included. Exclusion criteria: Students who did not consent, submitted incomplete questionnaires, or were interns or postgraduates were excluded from the study.

The online questionnaire was validated through the face and content validity techniques, by giving the draft questionnaire to the students to assess whether the response looks meaningful, well designed and a good measure of the construct to an innocent bystander. However, reliability testing of the questionnaire (such as internal consistency or test-retest reliability) could not be performed due to time and logistic constraints. In addition, the content validity of the questions was done by giving the questionnaire to three independent scholars from the fields of Public Health, Pharmacology, and Social Statistics to assess its appropriateness, clarity, coverage, and relevance to the study. While developing the questionnaire, frequently occurred, symptoms were obtained from CDC's guidelines

Each participant received an email link to the Google Form to avoid duplication of data. Clarification of the contents and the purpose of the study were explained at the start of the survey followed by an informed consent.

The questionnaire included 14 questions. Six questions aimed at capturing socio-demographic characteristics of study respondents. These included age, sex, marital status, city of

residence, comorbid condition. The next eight questions were on self-medication of drugs for prevention and treatment of respiratory symptoms: included drugs selection, reason for self-medication, symptoms, and sources of medicine and adverse effect of medicine used. The participants were asked questions if they had been using these medications before COVID-19 pandemic and do they have any comorbid conditions if they answered “NO” it was considered as self-medication during pandemic. The list of drugs in the survey included paracetamol, ibuprofen, azithromycin, hydroxychloroquine, ivermectin, montelukast, vitamin C, vitamin D, zinc, dexamethasone, calcium, multivitamin compounds, cough syrup or any other drug (open question) for respiratory symptoms. All these drugs were selected on the basis of existing literature and reports from local media. The COVID-19 symptoms included fever, sore throat, loss of smell/ taste, body ache and diarrhea. To assess the reason for self-medication, the options are: common habit, the symptoms are not severe, fear of going outside, financial problem, for prevention, unavailability of doctors, bad experience at the doctors, familiar with the course of disease and its treatment.

Results

In total 155 medical students completed the questionnaire and submitted through email. A total of 155 medical students completed and submitted the questionnaire via email. The overall prevalence of self-medication among all participants was 102(65.8%). Out of 155 medical students, 36 (23.2%) had tested positive for COVID-19 by PCR. Among these COVID-19–positive students, the prevalence of self-medication was 36 (23.2%).

Majority of the respondents were of 18-24 years of age 148 (95.5%) and 84 (54.2%) were male. Out of 155, 153(98.7%) were unmarried and 129(83.2%) were from outside Biratnagar city.

Table 1: Frequency distribution of respondents by their socio-demographic features.

Variables	Frequency	Percentage
Age		
18-24	148	95.5
25-39	7	4.5
Gender		
Male	84	54.2
Female	71	45.8
Marital Status		
Married	2	1.3
Unmarried	153	98.7
City		
Outside Biratnagar Metropolitan City	129	83.2
Biratnagar Metropolitan City	26	16.8

Out of 155 respondents, the most common comorbidity was thyroid, 2(0.12%) followed by asthma 1(0.6%), spine injury 1(0.6%), schizophrenia 1(0.6%), HTN 1(0.6%)

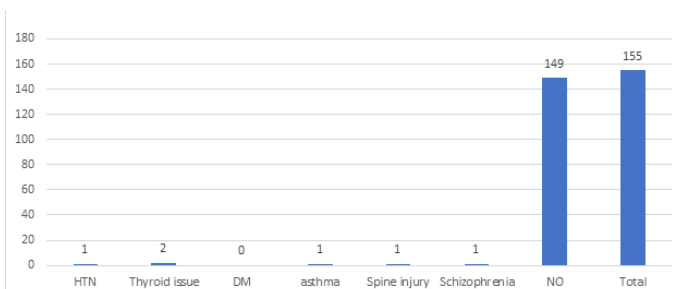


Figure 1: Chronic disease conditions among participants

The most frequently used drug among the respondents were paracetamol 29 (18.7%), azithromycin 13(8.4%), ibuprofen 12(7.7%), Vitamin-C 11(7.7%), multivitamin 10(6.4%), and zinc 10(6.4%) and cough syrup 9(5.8%) respectively.

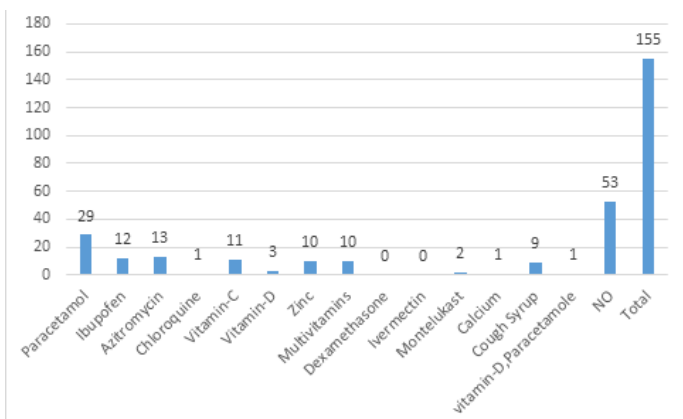


Figure 2: Frequency distribution of respondents use of drugs for self-medication

The reasons reported for usage of self-medications included; the symptoms were non-severe illness 61 (39.3%), fear of going outside during COVID-19 pandemic 20 (12.9%), quick relief 10 (6.4%) and self-medication practice for prevention 6 (3.9%).

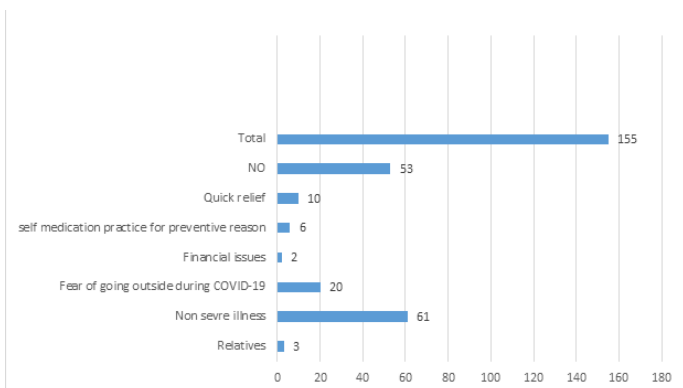


Figure 3: Reason for self-medication among medical students

However, 60 (38.7%) reported taking these medications when symptoms of COVID-19 developed, 36 (23.2%) used when PCR test was positive and 6 (3.8%) used medicines without symptoms for prevention of COVID-19.

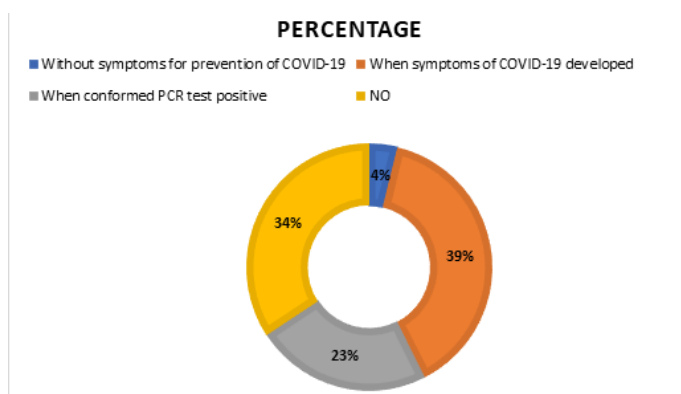


Figure 4: Use of self-medication during the COVID-19 Pandemic

Among the respondents, 30 (19.3%) took medications directly from pharmacy, 28 (18.7%) respondents took the drugs from textbook exposure, 14 (9.0%) took advice from friend and remaining 10 (6.4%) took medications from family doctors, advice from physician and telemedicine guidance.

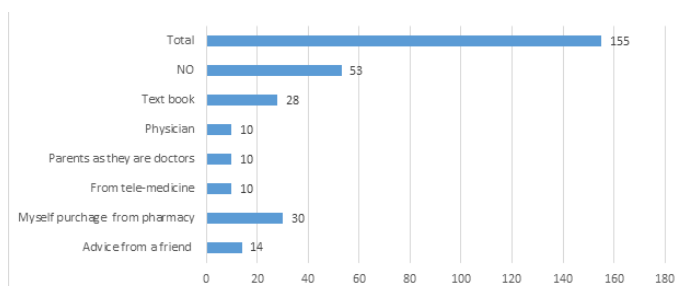


Figure 5: Source of medicine for self-medication

110 (70.96%) of the respondent did not face any adverse reaction while rest of students face bad reactions such as 10 (6.4%) gastritis, 9 (5.8%) diarrhea, 7(4.5%) itching/redness, 5 (3.2%) swelling, 3(1.9%) difficulty in breathing etc.

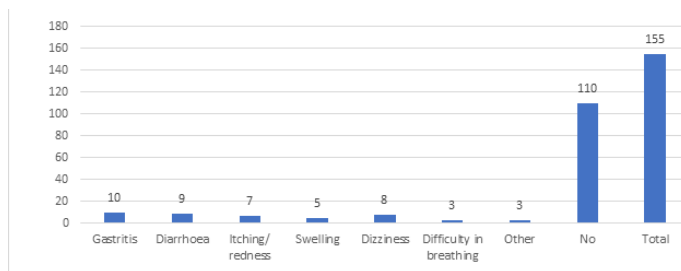


Figure 6: Adverse effect among participants during self-medication

Discussion

This study assessed the prevalence and pattern of self-medication for the prevention and treatment of COVID-19 among students of Birat Medical College-Teaching Hospital. A total of 155 medical students completed and submitted the questionnaire via email. Overall, 65.8% of participants reported engaging in self-medication, while among students who tested positive for COVID-19 by PCR, the prevalence of self-medication was 23.2%.

Almost equal proportion of male and female participated in the study and most of them (95.5%) belonged to 18 to 24 years of age. Highest number of respondents (98.7%) were unmarried. Maximum number of students (83.2%) were from outside Biratnagar. Among 155 respondents (56.1%) were not infected with COVID-19 and (43.9%) were infected.

The prevalence of self-medication reported in this study was (23.2%) which was constant with the finding of studies in Iran (19%), Umuahia, Abia State, Southeast Nigeria (30.3%), Togo (34.2%).^{12,13,14} The studies conducted in Dhaka, Bangladesh show self-medication rates of (88.33%), Pakistan (83%) and India (84%).^{3,10,15} Before COVID 19 pandemic, a study in Iran shows the prevalence of self-medication practice in university students was 70.1%.¹⁶ The lower rate observed in this study is due to high awareness and knowledge of self-medication in medical students.

In this study, paracetamol was the most commonly used drug for self-medication, consistent with findings among medical students in Pakistan, Nigerian undergraduates, and communities in Addis Ababa, Ethiopia, and Ecuador.^{10,17,18,19} Its frequent use may be due to easy accessibility and the perception that it alleviates common febrile symptoms. During the COVID-19 pandemic, overlapping symptoms of COVID-19 and malaria—such as fever, headache, and body aches—may have prompted individuals to self-administer paracetamol before seeking formal medical care.²⁰

Paracetamol use is widely used as first line pharmacotherapy analgesic for tackling pain disorders and different pyrexia. Paracetamol also known as acetaminophen, is mainly used to treat fever. Paracetamol is a medicine which has a good safety profile and the large doses may lead to severe hepatic necrosis and fatal hepatic failure.²¹ Accidental or incidental overdose of paracetamol may cause hepatotoxicity. The drug's toxic dosage effects must be known to person using it.

The second most commonly used drug in this study was vitamin C, which was also reported as the drug of choice in studies conducted in Jordan (57.6%), Togo (27.6%), and Nigeria (51.8%).^{9,14,22} In Pakistan (56%) used multivitamins while in Nigeria (28.2%) used vitamin supplements, and in Canada (64%) used vitamins.^{10,12,23} Multivitamins are multiple vitamins and minerals, trace elements all of which possess antioxidant properties. They have a crucial role in regulating immune function and can reduce risk of respiratory infection. During the first wave of Covid-19, a study in UK shows those regularly taking their diet with multivitamins had a lower risk of testing positive for SARS-CoV-2.²⁴

Azithromycin (13.2%) is the third most common self-medicated drug in this study. Studies in Dhaka Bangladesh (54.15%) and Pakistan (25.6%) use azithromycin as self-medicating drug.^{3,10} Azithromycin was the most common antibiotics that have been used as self-medication in nursing undergraduates in Saudi Arabia.²⁵ The use of antibiotics during self-medication promote antimicrobial resistance. More educational, policy and regulatory interventions are required to increase knowledge about antibiotic use and prevent the purchase of antibiotics

without prescription.

The most common reason for self-medication for this study were perception of symptoms not so severe (39.7%), quick relief (6.4%), preventive reasons (3.9%) and fear of going outside during COVID-19 (12.9%). This finding is more or less similar to the finding from Addis Ababa where the participants mentioned mild illness, previous knowledge about the medication and emergency use of the drug as a reason for self-medication.¹⁸ The symptoms reported for self-medication included fever (21.3%), body ache (16.8%), throat pain (12.9%), loss of smell or taste (9.6%) and diarrhea (2.6%). The study in Dhaka showed that symptoms like fever, throat pain, dry cough, loss of smell and taste and body ache.³ Fever followed by muscle pain were the highest symptomologies reported for medicine use in the study in Pakistan.¹⁰

Paracetamol was the most commonly used drug for the symptoms showed in studies in Dhaka and Pakistan.^{3,10} Pharmacy (19.3%), textbook (18.7%), and advice from a friend (9.0%) were identified as a significant source of drugs used for self-medication among our study participants. This result agreed with those reported by other studies in Iran and Addis Ababa community.^{13,18}

In developing countries like Nepal, self-medication had been widely practiced among medical students. The reason might be due to easy availability of drugs from pharmacy without prescription, little knowledge regarding drugs and hesitancy to visit doctors. The other reason might be awareness of drugs due to easy accessibility of information through media. So, education of the youth is required to ensure safe practice. If such practices are not stopped, danger drug interaction and adverse effects could increase.²⁶

The occurrence of adverse effects from the medications was 6.4%, 4.5%, 3.2%, and 1.9%, whereas the majority of participants (70.96%) did not report any side effects. The most commonly reported adverse effects were headache, gastritis, diarrhea, swelling, and allergic reactions. Paracetamol was the most frequently used drug in this study, followed by vitamin C and azithromycin. Given the mild and nonspecific nature of these symptoms, it is plausible that a proportion of the reported side effects may be influenced by psychological factors, such as expectation of adverse effects, symptom misattribution, or heightened vigilance while self-medicating.

Conclusion

In our study the most commonly used self-medication was paracetamol, vitamin C and azithromycin. The main source of medication was pharmacy, textbook and advice from a friend. Fever, body ache and throat pain were the common symptoms of the participants that took to self-medication.

It is a serious health issue especially during the pandemic period as many people self-medicate the drugs such as azithromycin. If this practice not stopped, self-medication can lead to serious health consequences. Efforts should be made to improve healthcare policies regarding awareness and sensitization about the risks of self-medication.

Recommendations

Controlling the non-prescribed medication which is bought over the counter from the chemist or pharmacist, and expanding access to healthcare, and implementing consumer awareness campaigns are some strategies that can be employed to stop self-medication. Educate students on risks of irrational self-medication. Strengthen access to tele consultation and formal healthcare channels.

Limitation of the study

Since traditional self-medication practices do not account for contemporary medication practices, the current study set out to evaluate them. There is a higher chance of underreporting because the study was a single-center, cross-sectional and relies on self-reported assessment. The attitudes of the participants on the practice of self-medication and the kinds of medications were not covered in this study. Furthermore, the study was conducted with health science students.

Acknowledgements

The authors would like to thank all the students who participated in the study.

Conflict of Interest: None declared.

Financial Disclosure

No funding was received for this study.

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