

# Frequency of Self-Medication and Knowledge about Out-of-Counter Drugs during the COVID-19 Pandemic in a Group of Iranian Dental Students

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## ABSTRACT

**Objective:** To study the frequency of self-medication and knowledge about out-of-counter drugs during the COVID-19 pandemic in a group of Iranian dental students. **Material and Methods:** A descriptive cross-sectional study was conducted among dental undergraduates from September 2021 to November 2021 after receiving ethical clearance from the Kerman Medical University Ethical Committee. A valid and reliable questionnaire, consisting of demographic data and questions about self-medication and knowledge about out-of-counter drugs, was sent to participants via E-mail. Data was analyzed by SPSS 26 software by using a t-test. The P-value was considered at a 0.05% significant level. **Results:** A total of 88 students participated in the study with a mean age of  $21.39 \pm 3.71$  years. Prevalence of self-medication was found in 53.4%. The most common cause for self-medication was headache. Acetaminophen was the most commonly used medicine for self-medication. Females had more self-medication than males, but there was no significant differences. There was no significant differences between entering year to university and self-medication. Younger students had significantly more self-medication ( $p=0.007$ ). Knowledge about out-of-counter drugs was moderate. **Conclusion:** Moderate self-medication as noticed. The out-of-counter drugs were the most used. Although out-of-counter drugs seem relatively safe, their improper use can cause serious side effects. Dental students need to be educated regarding appropriate safe medication and out-of-counter drugs.

**Keywords:** Drug Therapy; Nonprescription Drugs; Knowledge; Students; Prevalence.

## Introduction

The World Health Organization (WHO) defines self-medication as “the use of medicines or medical products by a consumer to treat disorders or symptoms diagnosed by him/herself, continuous use of a medicine previously prescribed by a physician for a chronic, recurrent disorder, or the use of a treatment by non-specialist medical sources or health staff who are not allowed to prescribe medicines” [1]. Self-medication is the treatment of self-diagnosed disorders and symptoms, the use of medicines, or the continued use of medicines for physical or mental illnesses outside the health care system without a physician’s prescription [2].

Its benefits are self-reliance, accessibility and low cost. Risk of misdiagnosis, delay or failure to receive medical advice, risk of side effects, spread or microbial resistance and improper administration, uncontrolled use of medicines, increasing resistance of pathogens, health hazards, adverse medicine reactions and long-term side effects are considered the risks of self-medication [3,4]. The reasons for willingness to self-medication are to reduce health care costs, such as the cost of consulting a physician and saving time. Self-medication predisposes the patient to various side effects and hides the symptoms of chronic diseases, resulting in a lack of diagnosis or non-treatment of them [5].

Prevalence of self-medication has been reported at 4-92% in South American and European countries [6]. The prevalence of self-medication in Nepali students was 50.3% and the most common cause was the use of medication due to headache and the most common medicine was analgesia [2]. Self-medication in India [7], Kolkata [8], Pakistan [9], Syria [10], Egypt [11], and Serbia [12] has been reported at 40.9%, 82.3%, 83%, 59%, 62.9, and 79.9%, respectively. Self-medication has been reported at 99% among Pakistani medical students and 78% among Sri Lankan students [13,14]. The pattern of self-medication varies in different populations and is affected by factors such as age, gender, income and cost, level of education, medical knowledge, satisfaction and lack of seriousness of illness and self-care [15,16].

In continuing our interest in medical research [17-19] and given the shortage of studies on the frequency of self-medication in dentistry students and the lack of study on dentistry students in Kerman and due to the situation of people in the Covid-19 pandemic and the imposed restrictions due to the existence of quarantine and minimal visits to medical centers, that can increase the possibility of self-medication, the present study aims to evaluate frequency of self-medication among dentistry students of basic sciences and pre-clinics who did not pass the pharmacology course.

## Material and Methods

### Study Design and Sample

This descriptive cross-sectional study was conducted on first- to third-year dentistry students of Kerman University of Medical Sciences through a census sampling method.

Inclusion criteria included people who participated in the study voluntarily. Students under the supervision of a physician due to any disease or had a history of hospitalization in the past three months were excluded from the study.

### Data Collection

The questionnaire was sent to the students via email with the necessary explanations. After sending the email, the students were given two weeks to respond. The purpose of the research was mentioned in the text of the email. They were requested to inform via email if they had any questions.

The data collection tool was a researcher-made questionnaire developed using articles. Its reliability using Cronbach's alpha coefficient was obtained at 0.89. The reliability of questions was obtained at 0.92 by answering questions. To determine the validity of the questions, five experts were provided. After their opinions, the questions were finally approved. To determine the reliability, the questions were given to 10 students. Again, after two weeks, the questions were given to the same students and the reliability coefficient of two times of answering was calculated. The questionnaire consisted of two sections: first section (demographic information including gender, age, year of entering the university, having insurance, having supplementary insurance) and the second section of self-medication, which included 12 questions including:

- 1) The cause of self-medication [including long distance from the physician / clinic, saving time, high cost of the visit, having a previous prescription, crowded clinic, having the same medicine in the family, lack of trust in the physician, and the pharmacist's advice];
- 2) Disease that causes self-medication (headache, muscular pain, asthma, urinary problems, hair loss, runny nose, diarrhea, menstrual cramps, weakness and dizziness, oral ulcers, fever, nausea, cough, skin diseases, joint pain, migraine, dry eye, dandruff, depression, acne, ulcers);
- 3) How the used medicines are selected (medicine price, manufacturer, medicine type, brand);
- 4) Reasons for using a particular brand of medicine (pharmacist's advice, old prescription of physician, previous use by friends and family, advertising, previous experience of using, others);
- 5) Place of preparation of medicine (pharmacy, online shopping, friends and family members, others);
- 6) Study before using the information brochure of medicine;
- 7) Paying attention to brochure information;
- 8) Side effects of self-medication;
- 9) How to eliminate medicine side effects;
- 10) The most commonly used medicines and the names of the medicines used.

Also, four questions were about the knowledge of out-of-counter (OTC) medicines that were answered yes or no.

#### Data Analysis

To analyze the data, SPSS-26 Software (IBM Corp., Armonk, NY, USA) was used. The Chi-square test for the association between knowledge and academic year and the t-test for assessing the correlation between knowledge and gender of participants were used.

#### Ethical Aspects

The proposal of this project with the code of ethics of IR.KMU.REC.1400.423 was registered in the medical ethics committee of Kerman University. The participants were assured that their names would not be mentioned in any part of the research and that their participation in the project was entirely voluntary.

#### Results

In this study, 88 first- to third-year dentistry students who met the inclusion criteria participated. Among them, 42 students were male (47.7%) and 46 (52.3%) were female. The mean age of students was  $21.39 \pm 3.71$  years. Regarding type of insurance, most people (47.7%) were covered by social security insurance. Regarding supplementary insurance, 60.3% of people were not covered by supplementary insurance (Table 1).

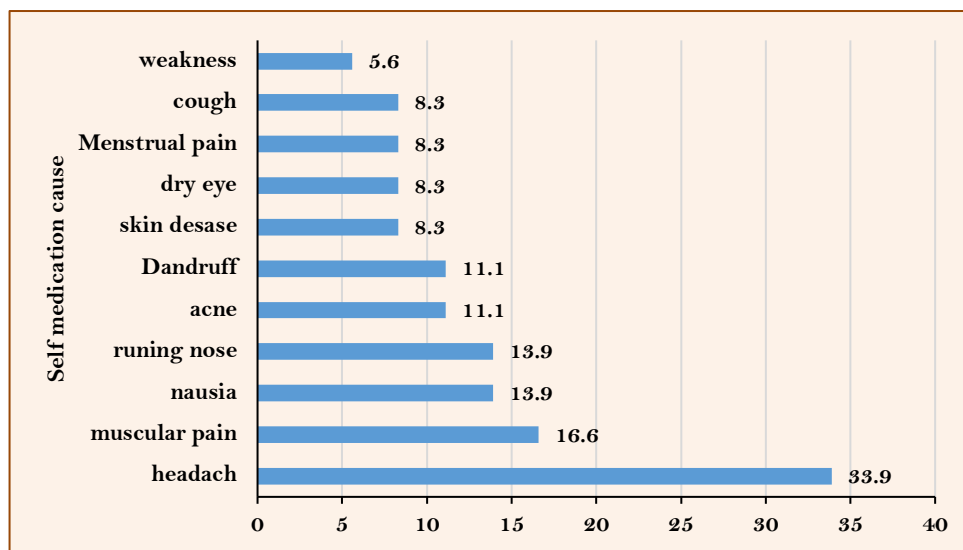
**Table 1. Frequency of participants based on demographic characteristics.**

Variables	Categories	N (%)
Gender	Men	42 (47.1)
	Female	46 (52.9)
Academic Year	First	23 (26.2)
	Second	31 (35.2)
	Third	34 (38.6)
Type of Insurance	Social Security Insurance	42 (47.7)
	Health Insurance	23 (26.2)
	Armed Forces Insurance	5 (5.7)
	Other	18 (20.5)
Having Complementary Insurance	Yes	35 (39.8)
	No	53 (60.2)

In the present study, 53.4% of people had self-medication in the last three months. The reason for self-medication in 27.3% of people was having a previous prescription and in 25.0% of cases, the reason was time-saving (Table 2). The most common diseases that caused self-medication were headache in 33.3% and muscular pain in 16.6% (Figure 1). In response to the question, "Which of the following cases do you consider when selecting a medicine for self-medication?", the type of medicine was the most common in 47.2% of cases. The pharmacy was the most important place to buy medicine in 91.7% of cases.

**Table 2. Frequency of participants based on self-medication and reason to do.**

Variables	Categories	N (%)
Having Self-Medication	Yes	47 (53.4)
	No	41 (47.1)
Reason to do Self-Medication	Having previous prescription	24 (27.3)
	Saving time	22 (25.0)
	High-cost doctors' visit	17 (19.3)
	Having the same medicine at home	15 (17.0)
	Office/clinic crowding	7 (8.0)
	Pharmacist recommendation	3 (3.4)



**Figure 1. Frequency of self-medication according to cause.**

In this study, 11.4% of people who self-medicated never read the medicine brochure. Among the people who read the medicine brochure occasionally or always, 50.0% mentioned that they understood it and its information to some extent and 8.3% did not understand it (Table 3).

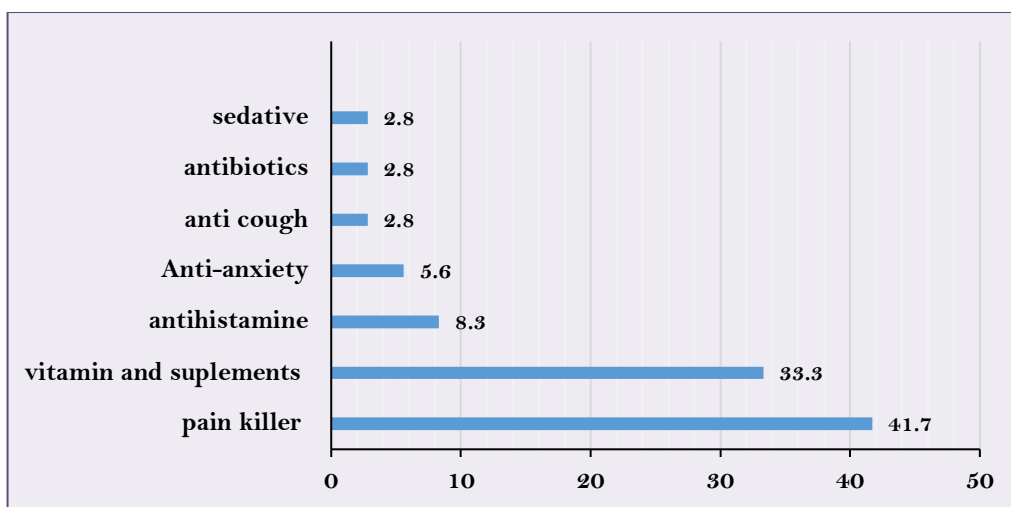
**Table 3. Frequency distribution of participants according to the effective factor in drug choosing, place of preparation and reading information brochure.**

Variables	Categories	N (%)
Effective factor in choosing a drug	Brand of drug	12 (13.6)
	Price of drug	19 (21.6)
	Drug manufacturer	15 (17.0)
	Type of drug	42 (47.7)
Place to get drug	Online shopping	2 (2.3)
	Pharmacy	81 (92.0)
	From friends and family	5 (5.7)
Reading drug information brochure	Sometimes	44 (50.0)
	Never	10 (11.4)
	Always	34 (38.6)

Also, 75% of people did not report side effects of self-medication. People who had side effects of self-medication stopped taking the medicine (Table 4). Analgesics (41.7%) and vitamins (33.3%) were self-medication medicines (Figure 2). In the group of vitamins and supplements, the consumption of vitamin B group was the most common, with 25%. Acetaminophen was the most common (38.9%) analgesic. Cetirizine was the most common antihistamine with 36.1% and amoxicillin was the most common antibiotic with 36.1%.

**Table 4. Frequency distribution of people according to the side effects of medication and its elimination.**

Variables	Categories	N (%)
Having side effect	Yes	22 (25.0)
	No	66 (75.0)
How to stop the side effects of the drug	Discontinue medication	27 (30.7)
	Visit a doctor	12 (13.6)
	Going to health center	7 (8.0)
	Consult a pharmacist	5 (5.7)
	Discontinue medication and visit a doctor	37 (42.0)



**Figure 2. Frequency distribution of drugs used in participants.**

All participating students were asked about OTC medicines and it was reported that 76.1% were aware of the term OTC (over-the-counter). Also, 39.8% were aware that none of the injectable medicines is included in the category of OTC medicines (Table 5).

**Table 5. Frequency distribution of people according to answering items about out-of-counter drugs.**

Item	Correct	Incorrect	Don't Know
	N (%)	N (%)	N (%)
OTC means selling medicine without a prescription.	67 (76.1)	13 (14.8)	8 (9.1)
There is no injectable drug in the OTC category	35 (39.8)	35 (39.8)	18 (20.4)
The maximum duration of use of an OTC drug is two weeks	40 (45.4)	32 (36.4)	16 (18.2)
Drug interactions are not considered in an OTC drug	43 (48.9)	31 (35.2)	14 (16.1)

OTC: Out-of-Counter Drugs.

In the present study, 56.5% of students who self-medicated were female and 45.2% were male. There was no statistically significant difference between the genders in terms of the frequency of self-medication ( $p=0.558$ ) (Table 6). Second-year students (42.0%) had more self-medication than the first- and third-year students. There was no statistically significant difference between the year of entering to the university and the frequency of self-medication ( $p=0.253$ ). Younger students had significantly more self-medication ( $p=0.007$ ).

**Table 6. Relationship between gender and year of university entry with self-medication.**

Variables	Categories	Self Medication		p-value
		Yes	No	
		N (%)	N (%)	
Gender	Male	19 (45.2)	23 (54.8)	0.558
	Female	26 (56.5)	20 (43.5)	
Year of University Entry	First	27 (30.7)	61 (69.3)	0.253
	Second	37 (42.0)	51 (58.0)	
	Third	24 (27.3)	64 (72.7)	

## Discussion

The present study observed self-medication in 52.9% of first- to third-year dentistry students. In a study by Kanwal et al. [13], self-medication was reported in 99% of first- to fifth-year medical students in Pakistan. The prevalence of self-medication was 62.9% among university students in Egypt [11] and 78% among Sri Lankan students [14]. Self-medication among dentistry students in Nepal was 83.3% [20]. The prevalence of self-medication in the current study was less than that reported in these studies.

In a study conducted by Gillani et al. [21] on non-medical students, 58.3% had self-medication in the past 6 months. Self-medication was reported at 48.3% in East Nepal, 40.9% in Pune, India, and 57.05% in West Bengal, which is similar to the present study [7,22,23]. The pattern of self-medication varies in different populations and is influenced by factors such as age, gender, income and cost, level of literacy, medical knowledge, not considering the disease serious, and self-care [15,16].

In the present study, the main reason for self-medication was having a previous prescription in 27.8% and not having time in 25%. In a study conducted by Niroomand et al. [24] on medical students, the main cause of self-medication in 56% of cases was previous experience with the disease. This difference may be due to differences in the study population. In the study conducted by Shrestha et al. [2], previous experience with 39% was the cause of self-medication, which is almost consistent with the present study.

Familiarity with medicines was the main reason for self-medication in India [25]. Faqihi and Sayed [26] reported that the most common reason for self-medication for nursing students was not having time to



consult and visit a physician (68%). In the studies conducted by Subashini and Udayanga [14] and Abdi et al. [27], 76% and 89.6%, respectively, reported that the main cause of self-medication was the previous experience of the disease. These differences might be attributed to the study population and research methods. In the present study, the most common disease [33.3%] for self-medication was headache. These results are in line with the results of other studies, such as the systematic study conducted by Rashid et al. [25] in India, Shrestha et al. [2] in Nepal, and Faqih and Sayed [26], in which headache was the main cause of self-medication. In the study conducted by Paudel and Aryal [28] in Nepal, headaches and body aches were the main cause of self-medication.

In the present study, acetaminophen was the most widely used medicine. This result was reported in other studies, including Shrestha et al. [2], in which paracetamol was the most common medicine; Faqih and Sayed [26], in which acetaminophen was the most common medicine; Gama and Secoli [29], in which nonsteroidal anti-inflammatory drugs (NSAIDs) were the most common medicine, and Abdi et al. [27], in which cold pills and acetaminophen were the most common self-medication medicines. Nonsteroidal anti-inflammatory drugs are commonly used in self-medication due to the availability and knowledge of people about their use [30-32]. In the present study, 91.7% of people bought the medicine from a pharmacy. In the studies conducted by Shrestha et al. [2] and Subashini and Udayanga [14], 57.3% and 86.9%, respectively, obtained their medicine from the pharmacy.

In many studies conducted around the world, pharmacies are often the most preferred source of medication and other therapeutic medicines [33-36]. In the present study, the most common antibiotic used by the participants was amoxicillin. This result is in line with the study conducted by Abdi et al. [27], in which amoxicillin was the most common antibiotic. In the study conducted by Mandal et al. [37], Azithromycin 80, and in the study conducted by Gillani et al. [21], metronidazole were the most common antibiotics. Regarding knowledge about OTC medicines, 76.5% were aware that OTC medicines mean over-the-counter sales and 45.6% were aware of the maximum duration of use of an OTC drug. In the study by Subashini and Udayanga [14], 37.7% of students were aware of the concept of OTC medicines. The knowledge that injectable medicines do not fall into the category of OTC was not at the adequate level. The reason seems to be the over-the-counter sale of ampoules of B-complex vitamins by pharmacies.





In the present study, female students had more self-medication than male students, but the difference was not significant. This result is consistent with that of other studies in which females reported more self-medication than males [13,27,38]. In the present study, younger students had significantly more self-medication, which is in line with other studies [14,38-40].

Since the present study was self-reported, some participants might have given unrealistic answers that are beyond the researcher's control. The results of this study cannot be generalized to all dentistry students.

## Conclusion

Self-medication was observed in more than half of the participants. The most common cause of self-medication was headache and the most common medicine was acetaminophen. There was no statistically significant difference between the year of entering the university, the gender of the participants, and the frequency of using self-medication. Younger students had significantly more self-medication. Knowledge of participants about out-of-counter medicines based on the percentage of correct answers was moderate. Although out-of-counter medicines seem relatively safe, their improper use can cause serious side effects. Students should be more aware of the negative consequences and side effects of self-medication.

## Authors' Contributions

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MKA		<a href="https://orcid.org/0000-0003-4485-5476">https://orcid.org/0000-0003-4485-5476</a>	Validation, Data Curation, Writing - Original Draft and Writing - Review and Editing.
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BMM		<a href="https://orcid.org/0000-0002-6186-8255">https://orcid.org/0000-0002-6186-8255</a>	Data Curation and Writing - Original Draft.
All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.			

## Financial Support

None.

## Conflict of Interest

The authors declare no conflicts of interest.

## Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

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