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Knowledge, Attitude, and Practice of Self Medication among Medical Students of Mashhad University of Medical Sciences, Mashhad, Iran

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ABSTRACT

Introduction:
Self-medication is a double-edged sword the proper application of which is appreciated by the World Health Organization (WHO) guidelines since it can reduce the unnecessary pressure on the health care system. However, self-medication can lead to severe consequences if utilized inappropriately. Furthermore, self-medication practice is an important social health issue in medical students as educated people and would-be physicians. This study aimed to determine the knowledge, attitude, and practice of self-medication in medical students of Mashhad University of Medical Sciences, Mashhad, Iran.

Materials and Methods:
This cross-sectional questionnaire-based study included 296 medical students at distinct levels of education. The data were analyzed in SPSS software (version 26).

Results:
Based on the findings, more than 80% of the students were aware of the complications, drug interactions, and importance of accurate use; however, only 9.1% and 27% of the participants were aware of the side-effects of herbal medicine and dietary supplements, respectively. Out of the total 296 participants, 83.5% of the cases declared that they did care about the side effects of medicines, and 81.3% of the students believed that a medical degree was essential for medicine prescription. In a confrontation with minor ailments, 21.9% of the cases practiced self-medication, and the majority (57.4%) of the used medicines were painkillers. The main reasons for self-medication was the underestimation of the disease (57.8%). Moreover, positive attitudes toward the safety of self-medication (P=0.04) and knowledge about medicine (P<0.001) were the major reasons for the self-medication practice in senior students, compared to juniors. However, no significant difference was found between seniors and juniors in terms of self-medication practice (P=0.85).

Conclusion:
Regarding the adverse effects of self-medication, drug dependency, microbial resistance, and high prevalence of self-medication among participants, it is suggested to provide educational programs on the adverse effects of self-medication. In addition, appropriate measures should be taken to control and prevent an easy access to medications.

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Introduction

The world health organization (WHO) defines the term "self-medication" as the self-diagnosis and use of medicine without consulting a physician (1). Self-medication is an important and non-ignorable part of self-care, as well as the first option that comes to one's mind when encountering common health problems (2). The WHO guidelines encourage the practice of appropriate self-medication for minor ailments since it lowers the pressure on the medical health system (3). However, the inappropriate use of self-medication can be potentially dangerous for many reasons, such as possible allergic reactions, side effects, habituation, interference with other medicines or foods, and concealment of otherwise serious disease symptoms (4). Furthermore, self-medication leads to medication wastage (5), and in case of antibiotics, it can result in antibiotic-resistance (6). The common reasons provided for this behavior are economic considerations, lack of time to visit a physician, easy access to the medical information on the Internet, and underestimation of the disease (7,8). Partial knowledge of the diseases and medicines is another motivation for the high practice of self-medication among medical students. According to previously conducted studies, there is a higher probability of self-medication practice among medical students due to several reasons. It was shown that 44.8% of the medical students in Bahrain practice self-medication in order to save time and money and get fast relief in case of usual ailments (9). Badiger et al. reported that 92% of medical students in South India practice self-medication due to its time-saving nature. They also mentioned the impact of wearing white coats for medical students in getting easy access to medications in pharmacies (10). Kumar Mehta et al. found that 84% of the medical students practiced self-medication routinely in Nepal (4). James et al. demonstrated that although senior medical students in Bahrain were aware of self-medication dangers, they practiced it frequently and confidently in an appropriate way (11). Self-medication practice rate varies in different countries depending on the health systems, as well as cultural and economic differences (5). Iran is among 20 countries with the highest rate of medicine consumption worldwide (12). It is worth mentioning that about 53% of the general population in Iran practice self-medication (7). The study of self-medication among medical students is very important since they are future prescribers and should be scrupulously aware of different aspects of this issue (4).

The importance of this awareness is highlighted in countries, such as Iran, regarding the high rate of self-medication. However, few studies have evaluated different aspects of self-medication among medical students in Iran. Therefore, this study aimed to evaluate knowledge, attitude, and practice of self-medication in medical students of Mashhad University of Medical Sciences, Mashhad, Iran.

Materials and Methods

Study Design

This descriptive-analytic cross-sectional study was conducted on a randomly selected sample of undergraduate male and female medical students (1st-5th-year students; age range: 18-22 years) of faculty of medicine at Mashhad University of Medical Sciences, Mashhad, Iran, during 2019. The sample size was first estimated to include 384 students considering a CI of 95%, α error of 0.05, a prevalence rate of 50%, and accuracy of (d)=0.05. Regarding the sample attrition, a total of 400 students were included in this study. A stratified random sampling method was used to obtain an adequate number of students in each grade considering the number of classrooms and the proportion of students per class.

Study Instrument

A self-administered questionnaire was developed in Persian based on the previous studies to measure knowledge, attitude, practice, and frequency of self-medication among medical students. In this study, the content validity was determined based on the opinions of 10 faculty members from the public health, pharmacology, and psychology departments in Mashhad University of Medical Sciences, Mashhad,

Iran. It should be noted that some revisions were applied using the experts' comments. The reliability of this questionnaire was assessed using Cronbach's alpha. Following that, the questionnaires were given to 30 health sciences students of Mashhad University of Medical Sciences, Mashhad, Iran, and the reliability was estimated at 83%. None of the questions were omitted after the evaluation of content validity and reliability. The questionnaires included 20 items covering sociodemographic and clinical information (age, gender, marital status, level and year of education, place of residence, health insurance, and parents' occupations), participants' knowledge and beliefs about the safety and consequences of self-medication, illnesses for which self-medication was practiced, types of used medicines, sources of advice, and sources for obtaining the medication.

Data Collection

The questionnaire was approved by the Research Committee of Mashhad University of Medical Sciences, Mashhad, Iran. The participants were selected using a table of random numbers, and they were informed of the research objectives and procedure. Moreover, they were assured of the confidentiality and anonymity of their responses. Afterward, written informed consent was obtained from the participants. Self-medication in the current study was defined as the use of any chemical medicines or herbal remedies without a physician's prescription over the past six months. Eventually, the students completed the questionnaires which were subsequently collected for data analysis.

Statistical Analysis

The obtained data were analyzed in IBM SPSS software (version 26) [IBM Corp., Armonk, NY, USA] through descriptive statistics (frequency, percentage, mean±SD). Moreover, a comparative analysis was performed using the chi-square test to compare the reaction of students to minor ailments and their reason for practicing self-medication regarding their level of education, gender, and parents' occupation (related or non-related to health care).

A p-value less than 0.05 was considered statistically significant.

Results

The data were collected from 296 undergraduate medical students of Mashhad University of Medical Sciences, Mashhad, Iran. Table 1 summarizes the demographic characteristics of the participants. Descriptive data regarding knowledge, attitude, and practice of self-medication among students are presented in the following.

Table 1: Demographic characteristics

	Variable	Percentage
Sex	Female	51.5%
	Male	48.5%
Marriage status	Single	93.8%
	Married	6.2%
Place of residence	Live with family	45.2%
	Dormitory	42.1%
	Live alone	12.3%
Career of parents	Health related occupations	24.9%
	Non-health related occupations	75.1%
Educational level	Basic sciences	62.8%
	Physiopathology	25.7%
	Stager	11.5%

Knowledge

About 60% of the students were aware of the possible side effects of "all" medications. Only a small proportion of the students were aware of the possible side effects of herbal medicines and mainly believed in the absolute safety of medicinal plants. Of all the participants, only a few students were aware of the side-effects associated with dietary supplements. Detailed responses to the items about knowledge are presented in Table 2.

Attitude

Most of the participants declared that they did care about the side effects of medication, herbal medicines, and drug interactions. It was widely accepted that the practice of self-medication was not acceptable for medical students and that a medical degree was essential for the prescription of medicine.

Tables 3 and 4 tabulate the general questions about attitude and detailed answers to special questions by medical students, respectively.

Table 2: knowledge questions

Number	Question	Yes	No	Don't know
1	Every drug can cause adverse side effects	60.8%	30.7%	8.4%
2	Herbal medicine do not cause adverse side effects	9.1%	82.8%	8.1%
3	Simultaneously use of chemical drugs can be dangerous, because of drug interactions	98%	0.3%	1.7%
4	Herbal medicines may interfere with chemical drugs	83.1%	3.1%	13.9%
5	Arbitrary increase in drug dosages, prescribed by doctor, may be dangerous	98.0%	0.3%	1.7%
6	Arbitrary decrease in drug dosages, prescribed by doctor, or its cessation may be dangerous	15.9%	76.7%	7.4%
7	Self-medication for kidney and liver patients may be excessively dangerous	93.6%	1.0%	5.4%
8	Dietary supplements do not cause much adverse side effects	26.9%	57.1%	16.0%
9	Self-medication can hide symptoms of a possible serious disease	76.7%	8.1%	15.2%
10	Self-medicating with antibiotics can cause antibiotic resistance	93.2%	2.0%	4.7%

Table 3: Attitude questions.

Number	Question	Totally agree	Agree	Disagree	Totally disagree	Don't know
1	Side effects of drugs are important to me	40.1%	53.4%	3.1%	0.%	3.4%
2	Side effects of herbal medicine is important to me	29.9%	51.7%	8.8%	1.4%	8.2%
3	Drug interactions are important to me	2.4%	6.1%	31.3%	57.8%	2.4%
4	Interactions between herbal and chemical drugs are important to me	39.1%	46.9%	5.1%	1.7%	7.1%
5	Taking drugs at the exact time and dose as prescribed by the doctor is important to me	49.1%	46.0%	3.1%	0.7%	1.0%
6	Pharmacist is a trustful source of therapeutic information in minor ailments	6.2%	36.8%	33.2%	10.0%	13.4%
7	Chemical drugs should only be taken in emergency cases	27.1%	54.6%	10.3%	1.0%	6.95
8	Approved drugs are totally safe	1.4%	6.8%	52.2%	33.8%	5.8%
9	Irrational use of drugs, may cause drug resistance	44.0%	49.8%	1.4%	0.3%	4.4%
10	Period of drug usage should be undertaken, even if the symptoms subside	39.1%	52.2%	4.5%	0.7%	3.5%

Table 4: questions regarding attitude toward self-medication of medical students.

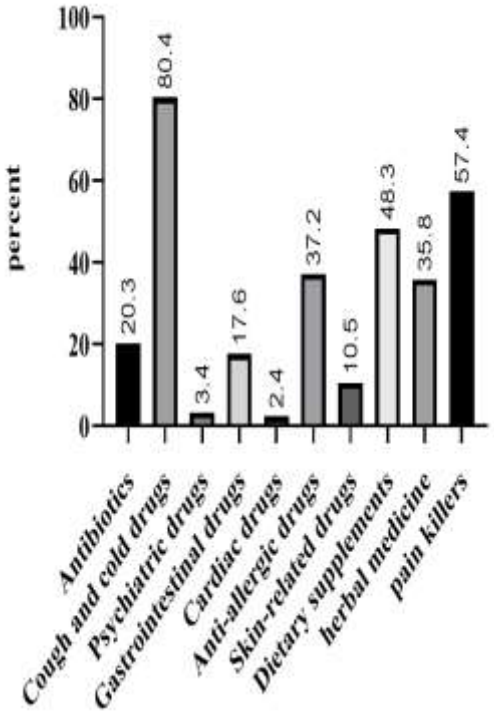
Number	Question	Totally agree	agree	disagree	Totally disagree	Don't know
1	Self-medication is acceptable for medical students	3.1%	29.1%	45.0%	12.1%	10.7%
2	Medical students can diagnose the diseases	3.1%	47.6%	31.3%	6.9%	11.1%
3	Medical students can treat the diseases	2.4%	28.8%	47.9%	6.9%	13.9%
4	Self-medication is harmful, when we do not know about the complications	11.4%	48.8%	25.3%	5.9%	8.7%
5	Medical degree is essential to prescribe medicine	23.2%	48.8%	16.3%	2.4%	9.3%
6	Medical students do not need to read the medicine brochure	5.5%	51.9%	39.4%	3.1%	0%

Practice

The majority of the students stated that they waited for the symptoms to subside in case they were confronted with minor ailments. Moreover, 37.5% and 21.9% of the participants visited physicians and practiced self-medication, respectively.

The main reasons for visiting a physician were the prolongation (62.2%) or worsening (60.8%) of the symptoms. Furthermore, the main types of medicines used for self-medication were pain killers and dietary supplements (Figure 1).

Fig 1: drugs used for self-medication



Additionally, the main ailments for which the students practiced self-medication were cough, cold, headache, and allergic rhinorrhea (Table 5).

Furthermore, the main reasons for practicing self-medication were underestimation of the disease (57.8%), repetition of previous doctor prescription (57.0%), as well as knowledge about medications and their complications (36.1%). The medicines used in self-medication were provided through the purchase of new medications (71.6%), use of leftover medicine from previous illnesses (53.4%), and supply by friends and family members (10.5%).

It is worth mentioning that most of the participants declared that they changed the medical directions prescribed by the physician after the symptoms subsided, and about half of the participants combined the prescribed herbal and chemical medicines (Table 6).

Table 5: Ailments that are being treated by self-medication

Number	Ailment	Percent
1	Sudden weigh loss	2.4%
2	Frequent urination	1.4%
3	Backache	13.2%
4	Toothache	29.4%
5	Muscle and joint pain	13.2%
6	Headache	64.9%
7	Rectal bleeding	2.7%
8	Diarrhea	19.9%
9	fever	28.7%
10	Cough and cold	74.7%
11	Anxiety	10.8%
12	Sore throat	36.1%
13	Sinusitis	8.8%
14	Influenza	9.1%
15	Allergic rhinorrhea	40.2%
16	Epistaxis	6.4%
17	Obesity	4.4%
18	Depression	2.4%
19	Migraine	9.8%
20	Fatigue	8.8%
21	Sleep problems	4.7%
22	Nausea or vomiting	17.6%
23	Cardiac problems	2.0%
24	Constipation or gastrointestinal problems	14.9%
25	Skin problems	5.7%
26	Urinary infection	1.7%
27	Dysmenorrhea	10.1%
28	Other	2.4%

Table 6: Questions regarding practice of self-medication in medical students.

Number	Question	Always	Often	Sometimes	Never
1	Do you exactly follow the medical prescription?	21.0%	69.2%	8.0%	1.7%
2	Do you change the medical direction when the symptoms subside?	4.6%	19.0%	45.8%	30.6%
3	Do you repeat the medical prescription, when your symptoms reappeared?	5.6%	38.7%	40.1%	15.5%
4	If you did not improved with following the medical prescriptions, do you increase drug dosages?	1.1%	2.5%	21.1%	75.4%
5	Do you use herbal medicine, besides medical prescriptions?	2.5%	11.6%	38.7%	47.2%

Analytic results

The students' responses regarding their reaction to minor ailments were compared in terms of the level of education, gender, and parents' occupation (related or non-related to healthcare). The chi-squared test showed that junior students tended more to consult a physician (P<0.001), and the participants whose parents' occupation was not related to the healthcare system were more encouraged to practice self-medication (P=0.02).

However, students with parents working in the health care system used to consult a physician more, compared to others (P=0.002).

The students' reasons for practicing self-medication were also compared regarding gender, years of education, and parents' occupation. The chi-squared test results showed that although there was no significant difference between seniors and juniors in terms of self-medication practice (P=0.85), the senior students used to justify their self-medication by a positive attitude towards the safety of self-medication (P=0.04) and their knowledge about medicines (P<0.001).

Regarding gender, the male students practiced self-medication due to the high cost of visiting the doctor (P=0.003) and previous experience of the disease (P=0.007).

Furthermore, the knowledge of medicines (P=0.01) was the reason for practicing self-medication in students whose parents were working in the healthcare system.

Discussion

In the present study, about 22% of the students stated that they practiced self-medication for mild illnesses in the past six months before the study. According to a meta-analysis, the prevalence rates of self-medication were determined at 53% and 67% in the general population and students in Iran, respectively (7). Some recent studies in Iran have reported a high prevalence of self-medication among medical students in Kermanshah (89.6%) (13), Ahvaz (85.6%) (14), and Ardabil (65%) (15). In this regard, Sawalha found a high prevalence of self-medication (98%) among Palestinian students (16). Similarly, Badiger et al. reported that 92% of the medical students in India practiced self-medication (10), and Zafar et al. stated that 76% of the students practiced self-medication in Karachi, Pakistan (17).

On the other hand, some studies have reported a lower prevalence of self-medication among medical students ranging from 14.2% to 45.7% (9, 18-22), which was more consistent with the findings of this study. The discrepancies in the results may be due to the differences in methodologies and various definitions of self-medication. It should be mentioned that the low prevalence of self-medication in the present study may be due to the students' awareness of self-medication side effects and their insufficient knowledge about medicines. One interesting finding of the present study was the lower level of practicing self-medication among students whose parents were

working in the health care system (P=0.02). In addition, they tended more to consult a physician (P=0.002), compared to other participants. This may be due to their enhanced self-care culture; however, a significant difference was found in terms of answers provided by the students to the knowledge and attitude questions. Regarding the level of education, juniors tended more to consult a physician, compared to seniors (P<0.001); however, there was no significant difference between the two groups in terms of practicing self-medication (P=0.85).

The results also showed that common cold medicines, analgesics, anti-allergic medicines, dietary supplements, and herbal remedies were the most frequently used medications. This may be due to the availability and cost-effectiveness of these medicines and the fact that they can be obtained as over-the-counter (OTC) medicines in Iran.

Accordingly, previous studies reported that common cold medicines (13,14,23-25), analgesics (5,9,10,13,17), dietary supplements (13,17,25), anti-allergic medications (13,17,24,25), and herbal medicines were highly used medications in the practice of self-medication (13). Additionally, antibiotics (5,13,14,17,23,25) and antipyretics (5,10,13) have been stated to be the target of self-medication.

In this study, the participants practiced self-medication mostly for common health problems, such as cough and cold, headache, allergic rhinitis, sore throat, toothache, and fever. These findings were in line with the results of previous studies in which cough and cold (5,9,10,17,22), headache (5,9,10,17,22,26), and fever were regarded as major medical conditions for which students tended to practice self-medication (5,9,10,17,22).

Based on the results of this study, major reasons for self-medication were found to be the underestimation of the illness, repetition of previous prescriptions for a similar illness, and possession of scientific knowledge in the field of medicine and medications. In line with the findings of other studies, the results of this study demonstrated that the most frequent causes of self-medication were the underestimation of the illness (5,10,13,17,23,24,27), former experience of the illness (13,17,24,27), availability of medication (13,23,24), lack of time to visit a physician (5,24,27), and cost-effectiveness (23,24). limit

Regarding gender, it was demonstrated that male students justified their self-medication by the high cost of visiting the doctor (P=0.003) and previous experience of the ailment (P=0.007); however, no significant difference was found between males and females in terms of the self-medication practice (P=0.89). This finding was inconsistent with the results of previous studies that had reported a higher frequency of self-medication in females (28).

Although there was no significant difference between the year of education and self-medication practice, seniors used to practice self-medication due to their knowledge about medicines (P<0.001) and positive attitudes towards the safety of self-medication (P=0.04). This may be fairly reasonable since they do not practice self-medication more, compared to juniors, and they highly rely on their knowledge in case of self-medication practice. According to the results, the major sources of medicine information used in the practice of self-medication include the recommendations of pharmacists, previously prescribed medications, and the advice of friends and family members. In line with the result of this study, the findings of other studies revealed that the main sources of obtaining medical information included access to OTC medicine (10,13,22,23,27,29), medicines leftover from previous prescriptions (23,26,29), advice of friends and family members (22,26), the Internet (13), and academic knowledge (29).

Regarding the limitations of this study, one can name the cross-sectional nature of the research design that presents the current situation which cannot be utilized to detect casual relationships. Moreover, the data were collected through a self-reported questionnaire which can result in the underestimation of self-medication and invalidated data. Furthermore, the students were asked about the practice of self-medication in the past six months, which might increase the possibility of recall bias. Eventually, the study was limited to

Mashhad University of Medical Sciences, Mashhad, Iran; however; the sample size was large and extensive enough to compensate for this limitation. Future studies are suggested to be multicenter, evaluate the predictive factors of self-medication, and focus on differences between medical and non-medical students.

Conclusion

Self-medication was fairly prevalent among medical students of Mashhad University of Medical Sciences, Mashhad, Iran. Based on the results, pharmacies can play a significant role in the control of self-medication through the prevention of medicine supply without prescription. In addition, educational and cultural programs should be established to improve the students' knowledge and information about the potential risks of self-medication, such as antibiotic resistance.

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