

Knowledge, Attitude and Practice of Pharmacy and Medical Students Regarding Self-Medication, A Study in Zabol University of Medical Sciences

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Abstract

Background: Self-medication is defined as using medicinal products to treat disorders or symptoms diagnosed by one-self. Although informed self-medication is one of the ways to reduce health care costs, inappropriate self-treatment can pose various risks including drug side effects, recurrence of symptoms, drug resistance, etc. The purpose of this study was to investigate the knowledge, attitude, and practice of pharmacy and medical students toward self-medication.

Methods: This study was conducted in Zabol University of Medical Sciences during 2018. A sample of 170 pharmacy and medical students was selected. A standard three-part researcher-made questionnaire was designed to address students' knowledge, attitude, and practice. Statistical analysis was performed in SPSS 25 software.

Results: According to the results, 97 (57.1%) of the students had carried out self-medication within the past 6 months. Overall, the students used self-medication on average of 4.2 ± 2.9 times per year. Self-medication was more prevalent in male students (65.4%, $P = 0.043$). Cough and cold were the most common symptoms treated with self-medication (93.2%), and antibiotics (74.4%) were the most commonly used drugs. The primary information source used by the students was their previous physician prescription (47.4%). Medical students' attitude toward self-medication was more positive than that of pharmacy students (19.82 ± 4.84 vs. 21.67 ± 4.05 , $P = 0.033$). Pharmacy students; however, showed higher levels of drug information ($P < 0.001$). There was a statistically significant association between the level of drug information and the rate of self-medication ($P = 0.005$). Disease recurrence was the most common negative complication of self-medication.

Conclusion: There is a need to educate pharmacy and medical students regarding self-medication and its side effects. The high prevalence of self-medication and the overuse of antibiotics can pose a significant risk of drug resistance.

Background

Self-medication is defined as using medicinal products to self-treat disorders or their symptoms. Overusing medications prescribed by a physician for oneself or other family members (especially when it comes to children or elderly) also falls within the definition of self-treatment [1]. Self-prescription of medicines without the advice of specialists can cause many side effects including bacterial resistance, drug complications, and prolonged disease course [2].

Responsible self-medication includes using the over the counter (OTC)-approved and relatively low-risk drugs to treat self-diagnosed disorders or symptoms [3]. Responsible self-medication can prevent the development of mild illnesses, thereby reducing health care financial burden by obviating the need for referring to health centers. In order to use a prescription drug safely and effectively, the consumer must accurately identify symptoms, ascertain therapeutic goals, and use appropriate drug products, dosages,

and therapy durations. Furthermore, medical history, contraindications, concomitant co-morbidities, potential adverse effects, and finally treatment responses should also be considered.

The prevalence of self-medication widely varies in different countries. For example, in Spain [4], Chile [5], Vietnam [6], China [7], and India [8], the frequencies of self-medication have been 12.7%, 75%, 40–60%, 32%, and 71%, respectively. In comparison with other countries, the estimated per capita drug usage in Iran has been relatively high from which self-medication shares a substantial part [9]. Factors such as gender, income, personal health, and drug information can affect the tendency toward self-medication [10].

The prevalence of self-medication among different social groups in Iran has ranged from 35 to 90% [11, 12]. Pain killers, eye drops, and antibiotics bear the largest shares of self-treatment drugs used by Iranians [13, 14]. The most important factors encouraging self-medication in Iran and the world have been suffering from mild self-diagnosed symptoms, having prior drug prescriptions, insurance problems, lack of awareness, ease access to drugs, and cultural and socio-economic issues [12, 15]. The most important diseases self-medicated in Iran have been respiratory diseases, colds, and headaches [16]. Studies conducted in different parts of Iran have revealed higher prevalence of self-medication among students than general population [11, 17, 18].

Pharmacists and physicians, particularly, can play key roles in providing helpful recommendations on proper and safe use of pharmaceutical products. Therefore, the purpose of this study was to investigate the knowledge, attitude, and practice of pharmacy and medical students toward self-medication.

Methods

The present descriptive cross-sectional survey was conducted on pharmacy and medical students of Zabol University of Medical Sciences, Sistan and Baluchestan province in south-east of Iran in 2018.

Sample size

The sample size was determined as 170 considering the rate of 50% for good knowledge and attitude, 90% confidence interval, and maximum error rate of 7% using the following formula.

$$n = \frac{z^2 * p(1 - p)}{d^2}$$

The students of medicine and pharmacy faculties sequentially entered into the study. One class was selected from entries of each year. For interns who did not attend classes, the researcher referred to their internship hospitals (Amir-Al-Momenin and Imam Khomeini hospitals of Zabol city).

Data collection

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A researcher-made questionnaire was used to collect the data. The questions were designed in three parts assessing the knowledge, attitude, and practice. For the knowledge, the students were initially asked if they can correctly name three OTC drugs and then were given six statements and asked to determine whether these statements were true or false. The participants were assigned three levels of good, average, or poor knowledge based on the Isacson and Bingeforse method [19]. For attitude, the students were asked to rate their agreement or disagreement toward multiple propositions about self-treatment. For determining practice, questions were asked about types of drugs, ailments, reasons, and negative outcomes of self-treatment.

Validity and reliability

The validity of the questionnaire was evaluated with the help of specialists in pharmacy, medicine, and epidemiology incorporating necessary corrections suggested by them. The reliability of the questionnaire was approved after being completed over two occasions by 30 students and determination of Cronbach's alpha coefficient. The researcher attended the students at the time of completing the questionnaires to resolve any ambiguity.

Statistical analysis

SPSS 25 software was used to analyze the data, compare the variables, and report the results. Quantitative variables were described with mean and standard deviation, and qualitative variables were described using percent frequency. Quantitative variables were also compared by either independent samples student t-test (for normally distributed data) or Mann-Whitney U test (for non-normally distributed data). Comparison of qualitative variables between the groups was performed by Chi-square test. P values < 0.05 were considered statistically significant.

Results

Demographic information

In this study, 170 students were interviewed from whom 78 (45.9%) were males and 92 (54.1%) were females. The mean age of the students was 21.92 ± 1.8 years. The youngest and oldest participants aged 18 and 29 years old, respectively. Of the participants, 105 (61.8%) were medical and 65 (38.2%) were pharmaceutical students. In terms of the year of enrollment, most participants (22.4%) were senior (three years or higher). Demographic information has been shown in Table 1.

Table 1
Demographic features in 170 medical and pharmacy students

Variables		N	%
Gender	Male	78	45.9
	Female	92	54.1
Field of study	Medicine	105	61.8
	Pharmacy	65	38.2
Residency	Dorm	129	75.5
	With family	36	21.2
	Leased	5	2.9
Chronic disease	Yes	18	10.6
	No	152	89.4

History of self-medication

Out of 170 students, 97 (57.1%) used self-medication within the past six months. A significant association was found between self-medication and gender ($p = 0.043$), but not the field of study, residency, and history of chronic diseases (Table 2).

Table 2
Association of self-mediation within past six months with demographic variables in 170 medical and pharmacy students

Variables		Self-treatment		P
		Yes	No	
Gender	Male	51 (65.4)	27 (34.6)	0.043
	Female	46 (50)	46 (50)	
Field of study	Medicine	60 (57.1)	45 (42.9)	0.978
	Pharmacy	37 (56.9)	28 (43.1)	
Chronic diseases	Yes	12 (66.7)	6 (33.3)	0.456
	No	85 (55.9)	67 (44.1)	

Students' knowledge and attitude toward self-medication

When the participants were asked to name three drugs that can be obtained without a prescription (i.e. OTC drugs), 12.9% were able to provide completely correct answers (Table 3). There was no difference in the level of knowledge comparing students with or without history of self-medication ($P = 0.480$). The level of knowledge was significantly associated with the field of study ($p < 0.001$), year of entrance ($p = 0.002$), and history of self-medication ($p = 0.005$) (Table 4). The students' attitudes regarding self-medication statements have been presented in Table 5.

Table 3
The level of awareness of medical and pharmacy students from OTC drugs

Frequency of correct answers	N	%
3/3	22	12.9
2/3	45	26.5
1/3	44	25.9
0/3	8	4.7
No knowledge	51	30
Total	170	100

Table 4
The level of knowledge among medical and pharmacy students regarding self-medication

Variables		Awareness			P
		Good	Moderate	Poor	
Gender	Male	19 (24.4)	39 (50)	20 (25.6)	0.228
	Female	32 (34.8)	35 (38)	25 (27.2)	
Field	Medicine	16 (15.2)	52 (49.5)	37 (35.2)	< 0.001
	Pharmacy	35 (53.8)	22 (33.8)	18 (12.3)	
	No				
Year of education	First year	2 (4.5)	25 (56.8)	17 (38.6)	0.002
	Second and more	49 (38.9)	49 (38.9)	28 (22.2)	
Self-treatment	Yes	38 (39.2)	40 (41.2)	19 (19.6)	0.005
	No	13 (17.8)	34 (46.6)	26 (35.6)	

Table 5
The medical and pharmacy students' attitudes regarding self-medication

Statements	Attitude				
	Completely agree	Agree	No idea	Disagree	Completely disagree
Self-treatment is part of self-care	19 (11.2)	51 (30)	41 (24.1)	47 (27.6)	12 (7.1)
Would you like to start or continue your therapy?	22 (12.9)	60 (35.3)	40 (23.5)	36 (21.2)	12 (7.1)
Do you recommend self-treatment to others?	10 (5.9)	24 (14.1)	45 (26.5)	57 (33.5)	34 (20)
Should drug release be free?	9 (5.3)	14 (8.2)	35 (20.6)	67 (39.4)	45 (26.5)
Need No Training on the Disadvantages of Self-Treatment?	11 (6.5)	13 (7.6)	31 (18.2)	53 (31.2)	62 (36.5)
There is no need to try to simplify access to health care facilities	9 (5.3)	16 (9.4)	30 (17.6)	51 (30)	64 (37.6)

The overall mean (SD) attitude score was 20.53 (4.63). No significant correlations were detected between the mean attitude score and neither age nor the year of entrance. There was a significant difference in the mean attitude scores of medicine and pharmacy students (Table 6, $p = 0.033$).

Table 6
The mean attitude scores among medicine and pharmacy students based on demographic variables

Variables		Mean attitude score		P
		Mean	SD	
Gender	Male	20.25	4.93	0.667
	Female	20.77	4.37	
Field	Medicine	19.82	4.84	0.033
	Pharmacy	21.67	4.05	
Residency	Dorm	20.23	4.75	0.318
	With family	21.61	3.51	
	Leased	20.6	7.82	
Chronic disease	Yes	20.83	4.32	0.829
	No	20.5	4.68	

Students' performance regarding self-medication

Overall, the students used self-medication on average of 4.2 ± 2.9 times per year. Modern medicine (allopathy) with 69.2% was the most frequently used method in comparison with traditional Islamic medicine (29.9%) and other types of therapies such as Indian medicine, homeopathy, etc. (10.3%). Cough and cold, headache, and muscle cramps were the most prevalent ailments treated by self-medications with 93.2%, 60.7% and 42.7%, respectively (Fig. 1).

Drugs used for self-medication

Antibiotics were the most commonly used drugs for self-treatment with 74.4%. Painkillers (59%) and antihistamines (48.7%) were the next most commonly used drugs (Fig. 2).

Reasons of self-treatment

The most common incentives encouraged the students to use self-medication were the illness being non-acute, and the students' reliance on their academic knowledge (Fig. 3).

Information sources

The information sources used by students for self-treatment have been shown in Fig. 4. Most students (47.4%) had used previous prescriptions as their information sources, and 39.3% used their academic knowledge.

Negative impacts of self-treatment

Figure 5 shows that disease recurrence was the most common negative complication of self-medication. Also, 50% of the students reported no negative impacts.

Discussion

Our study showed that 57% of pharmacy and medical students of Zabol University of Medical Sciences who participated in the study had at least one episode of self-medication during the past six months. The prevalence of self-medication in Iran and other countries highly varies among different demographic groups. For example, a similar study among medical and pharmacy students in Ethiopia reported a prevalence of 38.5% [20]. Also, 44.8% of Bahraini [21], 78.6% of Indian [22], and 55.2% of Egyptian [23] medical students reported episodes of self-medication. In another study, 98% of Palestinian students [24] reported self-treatment. Among studies in European countries, two studies performed on Slovenian [25] and Serbian [26] students reported frequencies of 69.2% and 79.9%, respectively. A study on a Spanish

adult population also reported 45% prevalence for self-treatment for cold [27]. A study on German adolescents showed a self-medication prevalence of 8% [28]. In another study on patients with gastro-esophageal reflux disease in France, self-medication was reported by 17% of the participants [29]. Overall, the results of the present study showed a much higher prevalence of self-treatment compared with developed countries and similar to that of developing countries. It has been shown that the prevalence of self-medication is generally higher in developing than developed countries [30]. This difference could be due to differences in the levels of welfare and income per capita and therefore the ability to pay for health cares, the quality of health care services, as well as the efficiency of monitoring programs on prescription of drugs by supply centers [31].

Among the studies conducted in other parts of Iran, self-medication was reported in 91% of Kerman students [32], 83% of Yazd University of Medical Sciences students [33], and 80% of Ardabil students [34]. A review study conducted in 2015 by Azami et al. reported frequencies of 53% and 67% for self-medication in Iranian general population and students, respectively [35] which were close to the prevalence reported in the present study. Self-medication seems to be typically higher among students than the general population. This could be due to a variety of reasons such as students' higher pharmaceutical and clinical knowledge, their better access to the Internet and mass media advertising pharmaceutical products, and the cost-effectiveness and time-saving nature of self-medication [36]. Nevertheless, populations under the study, and research and data analysis methods are different in various studies making difficult to compare the prevalence of self-medication among different societies.

The results of the present study showed that there was no significant difference in the frequency of self-medication between the medicine and pharmacy students. The presence or absence of chronic diseases also had no significant impact on the rate of self-treatment among the students. However, male students had more frequently used self-medication than females. This observation was different from that of two other studies in which females have self-medicated more commonly than males [22, 23]. In a number of studies; however, there were no significant differences between males and females in this regard [21, 25].

Regarding the knowledge, only 12.9% of our students were able to correctly name three OTC drugs. The ratio of students who could recall 2 or more OTC drugs was 39.4%, and the rest of the students knew either one or none of the OTC drugs. In a study on pharmacy students in Addis Ababa, Ethiopia, 47.3% of students did not know the OTC drugs as well. In the next part of the knowledge survey, the participants' knowledge was assessed using the Isacson's and Bingforse method [19]. Overall, 26.5% of the students had poor scores, while 43.5% and 30% attained average and good scores respectively. In line, a similar study on Palestinian students using the same grading method reported that one-third of students had poor scores while others acquired average and good scores [24]. In general, medical and pharmaceutical students seem to need more effective educations in this area.

According to our results, students with higher drug information were more likely to self-medicate. In a review study, Isacson et al. showed an association between drug knowledge and a positive attitude toward self-medication [19] which was consistent with our observation. Gender had no significant impact

on drug information, but the field of study significantly overshadowed the students' drug information. Pharmacy students had higher levels of pharmacological information than medical students. Overall, 16% and 35% of our medical and pharmacy students achieved good scores regarding drug information. This indicates the difference in the number of drug courses between the two groups and deeper integration of pharmacy students with pharmaceutical products. Also, senior students (two-year and higher) had superior levels of drug information than juniors (one-year) indicating the impact of educational courses on their drug knowledge.

In the attitude section, each student was given an attitude score based on the answers provided to multiple statements. A higher score indicated a more negative attitude towards self-treatment. The only variable that had a significant impact on attitude score was the field of study as pharmacy students had more negative attitude than medical students which may be related to their higher pharmaceutical knowledge. A study by James *et al.* in 2005 also noted that higher levels of medical and pharmaceutical knowledge make people more cautious about taking and recommending medications [19].

Regarding the students' performance, cough and cold along with headache were the most common self-treated ailments. These results were consistent with those of most similar studies [23, 37, 38]. Antibiotics (74.4%) and painkillers (60%) were the most commonly drugs used for self-medication among our students. In a study on first-year medical students in Bahrain, only 6% of participants used antibiotics for self-treatment [21]. In other studies, this rate reached 17.2% in Ethiopia [38], 38.9% in Serbia [26], 19.9% in Palestine [24], and 34% in India [39]. These rates of antibiotic usage for self-treatment are much lower than those of European and developed countries [40]. In a study by Aljinovic *et al.* in Croatia, they found that using antibiotics for self-treatment was higher among people working in healthcare systems than the general population [41] supporting our observation in this study. The rate of self-administrated antibiotic use observed here was similar to most other studies conducted in Iran and higher than rates reported in other parts of the world. According to this, the risk of antibiotic resistance may be a serious threat to our society in future.

The most important reason for self-medication was noted as the non-acute nature of the disease, and the most common information sources were previous prescriptions among our students. These observations were consistent with previous reports in this field [42]. Our participants reported their academic knowledge (40%) and confidence in the knowledge (31%) as the most common information source and cause of self-medication, respectively. This evidence may reflect the fact that our students were aware of the dangers of self-medication; but at the same time, they believed that they were equipped with sufficient knowledge to stay safe. Nevertheless, our results showed that only 16% of medical students and 35% of pharmacy students had good drug information levels. An important point in our study was the students' low tendency to consult with a pharmacist as one of the most accessible sources of ensuring safe self-treatment. Only 13.7% of the students mentioned consulting with a pharmacist as one of their information sources for self-treatment. Medical students seem to need more education about the dangers of irresponsible self-treatment.

Conclusions

As responsible self-medication is one of the main strategies to reduce health care costs, it seems that the role of pharmacists is particularly important in this regard. Introducing pharmacists as major contributors to public health system is critical. Medical and pharmacy students, as future health professionals, should be more educated about good pharmacy practice.

Abbreviations

OTC: Over the counter

Declarations

Ethics approval and consent to participate

The study was approved by the Ethics Committee of Zabol University of Medical Sciences (IR.ZBMU.REC.1396.160). The students also gave verbal consent to participate in the survey.

Consent for publication

Not applicable.

Availability of data and materials

All data generated or analysed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

MH supervised and developed the concept and design of the study, MA performed statistical analysis, ZK gathered the data, AB drafted the manuscript, RR helped in data interpretation and analysis, KT supervised the study and critically revised the manuscript. All authors have read and approved the manuscript.

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Figures

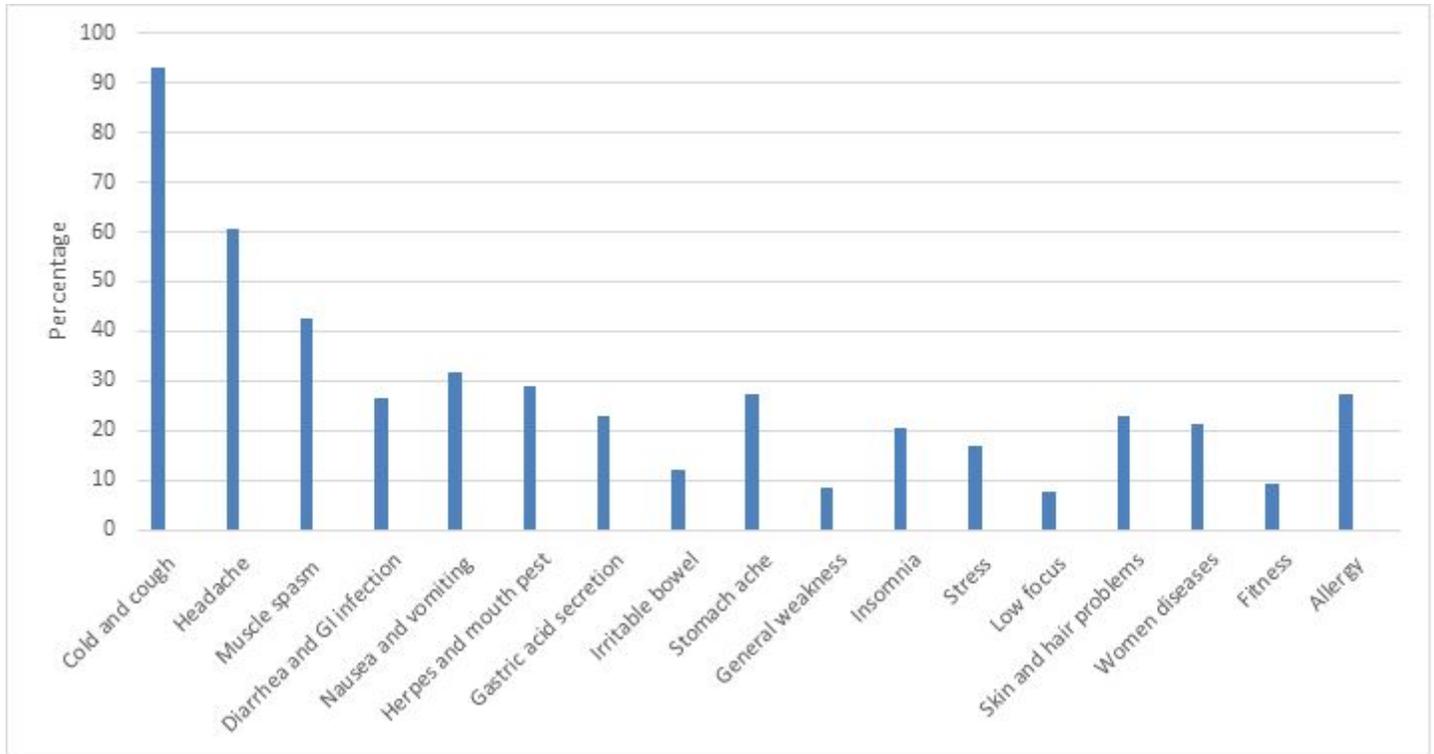


Figure 1

Most common diseases treated with self-medication among medical and pharmacy students

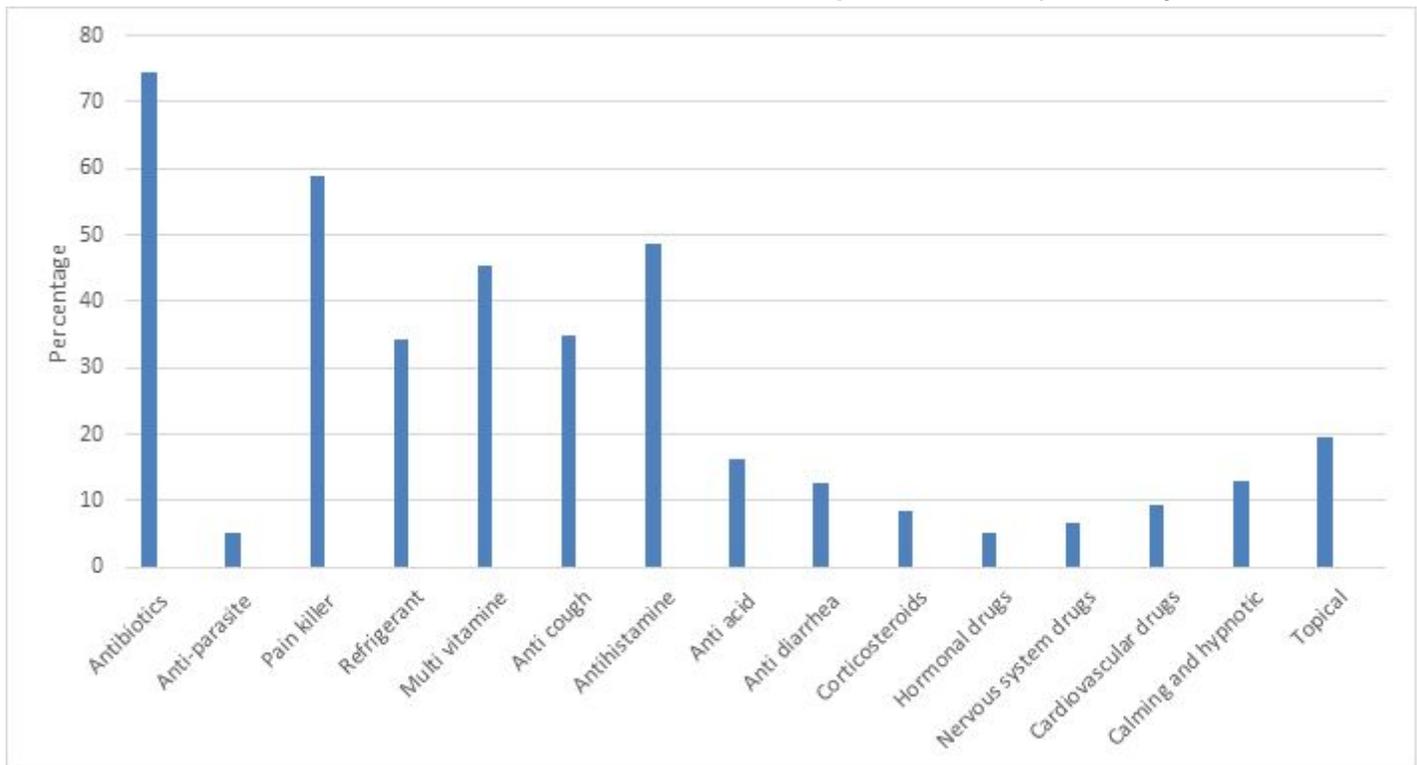


Figure 2

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Most common drugs used by the students for self-medication

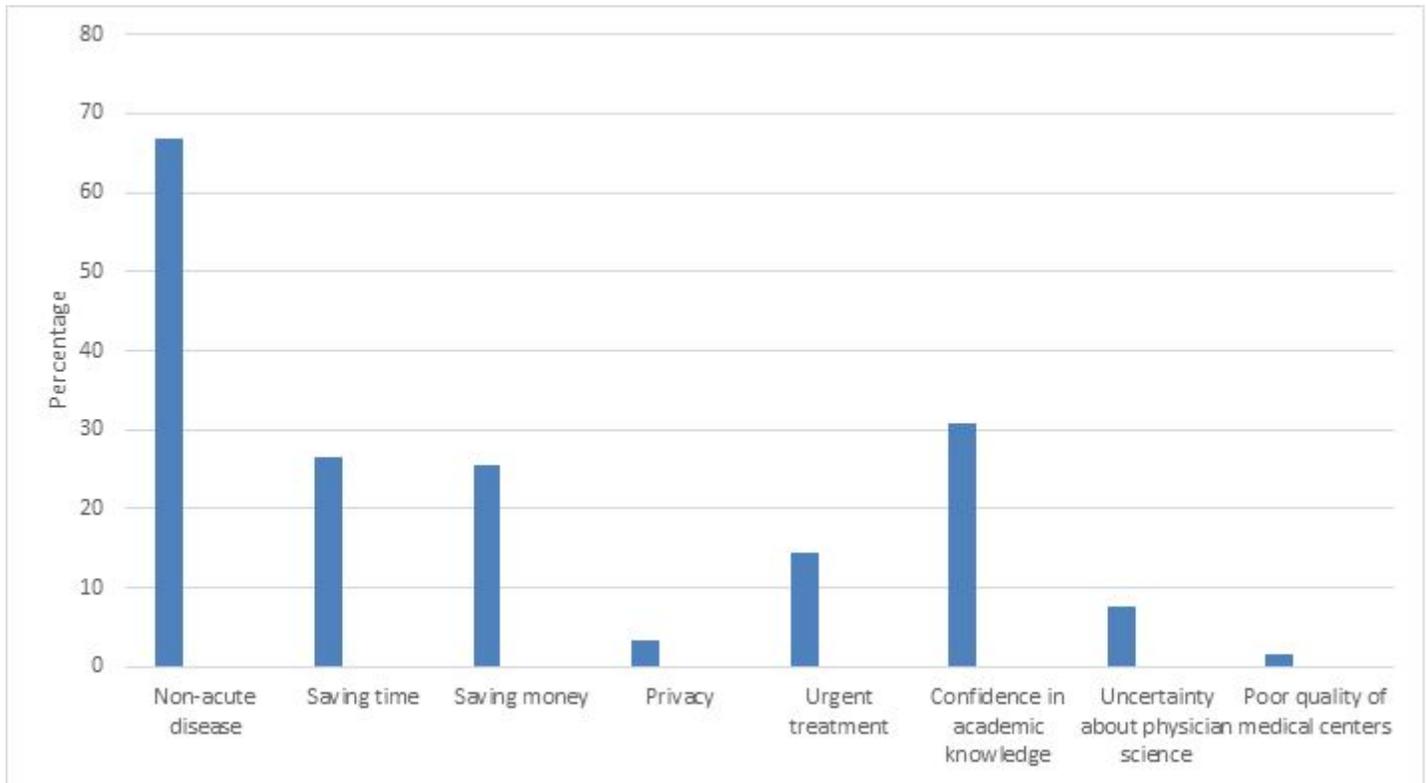


Figure 3

Common reasons for self-medication among Iranian pharmacy and medical students

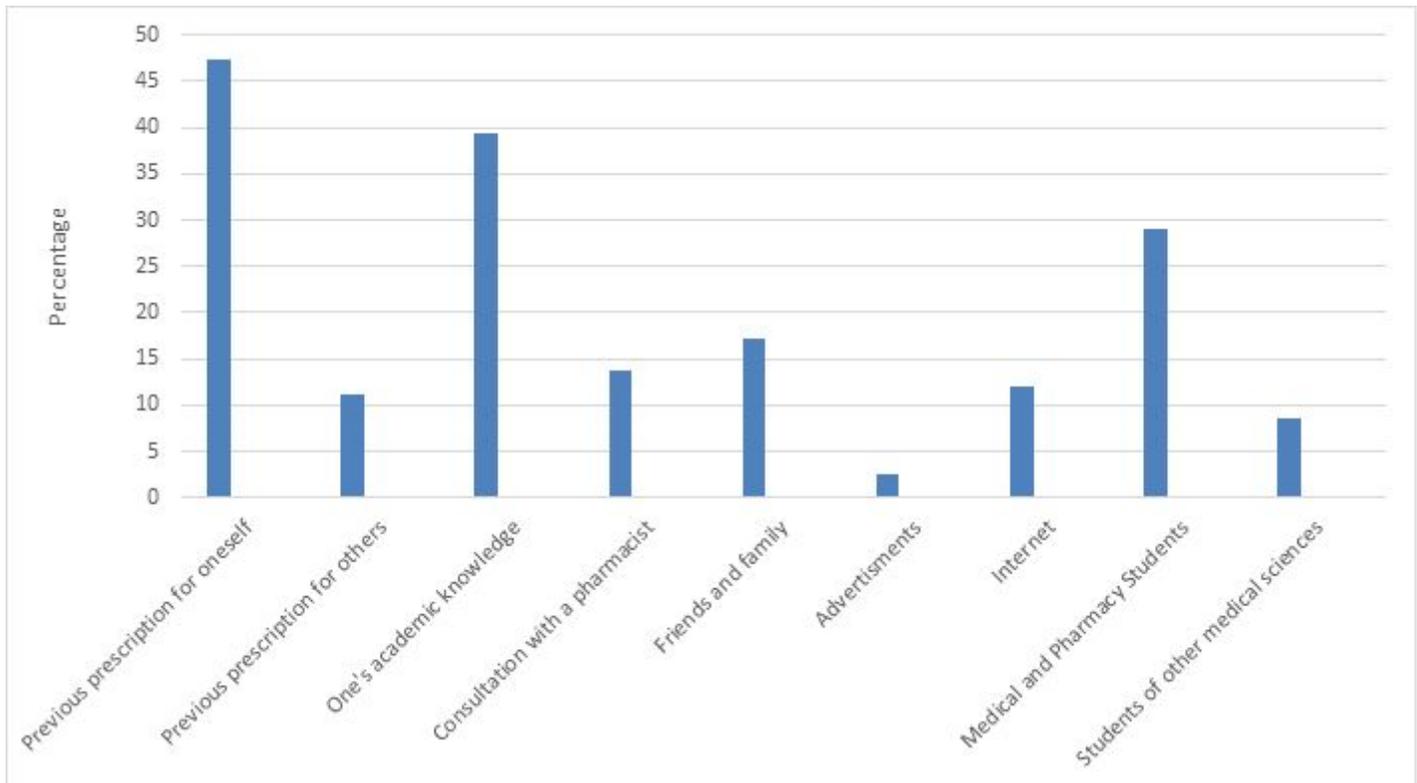


Figure 4

Information sources used by pharmacy and medical students to self-medicate

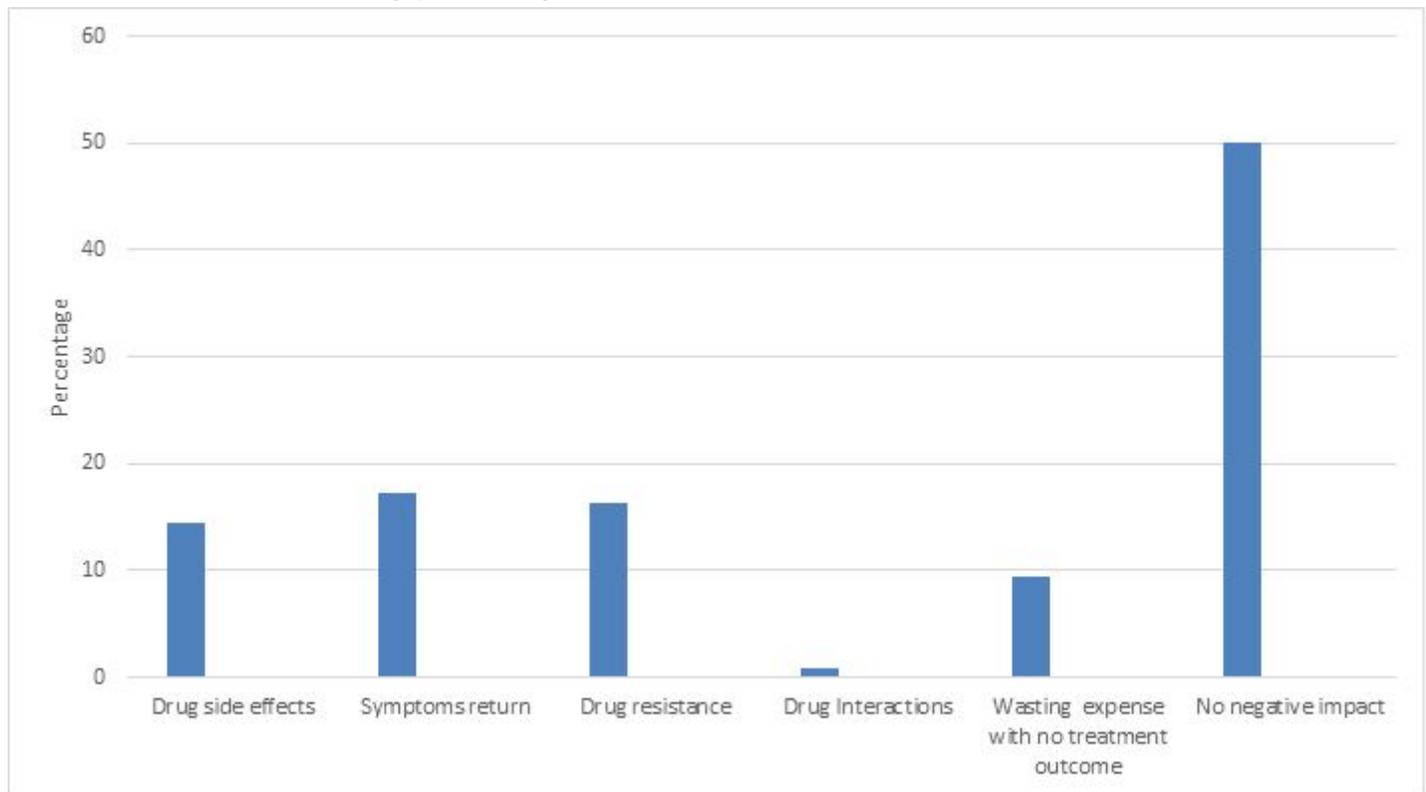


Figure 5

Negative impacts of self-treatment

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