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ORIGINAL RESEARCH article

Self-medication patterns among Libyan University Medical Students

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Abstract: Self-medication, the practice of using medications without professional guidance, is a significant public health concern globally, particularly among medical students who, despite their pharmacological training, often engage in this practice at high rates. This cross-sectional study aimed to assess the prevalence and patterns of self-medication among medical students at the University of Tripoli, Libya. A sample of 121 undergraduate medical students was surveyed using a semi-structured questionnaire. The results revealed a high prevalence of self-medication (82.6%), with analgesics (51.2%) and vitamins (31.4%) being the most commonly used medications. Headache (80.4%), pain (79.9%), and respiratory issues (73.2%) were the primary health complaints prompting self-medication. Key determinants included pharmacist advice (43.8%), prior medical knowledge (32.2%), and recommendations from family or friends (12.4%). Factors such as residing in Tripoli and higher parental education levels were significantly associated with increased self-medication practices. Notably, 62.0% of the students reported using antibiotics without a prescription, raising concerns about antimicrobial resistance. The study highlights the need for educational interventions to promote responsible self-medication practices among medical students, emphasizing the risks associated with inappropriate drug use. Addressing these issues early in medical education could help mitigate the public health implications of widespread self-medication.

Introduction

Self-medication, the practice of using medications without professional guidance to address self-diagnosed ailments, is a global public health concern. While convenient, it carries risks such as misdiagnosis, adverse drug reactions, and antimicrobial resistance [1, 2]. Medical students, poised to become future healthcare providers, represent a unique demographic in this context. Their advanced pharmacological training theoretically equips them with the knowledge to make informed decisions [3]. Yet, paradoxically, studies suggest they frequently engage in self-medication at rates exceeding the general population [4]. This trend raises critical questions about the interplay between awareness and behavior. Medical curricula extensively cover drug mechanisms, self-medications, contraindications, and risks, yet stressors like academic pressure, limited time, and normalized cultural practices may drive students toward self-reliance [5]. Commonly used substances include over-the-counter analgesics, antibiotics, and even psychotropics, reflecting both

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accessibility and the high-stress environment of medical education [6, 7]. Existing research reveals contradictions. While students demonstrate awareness of self-medication risks, practical adherence to guidelines remains inconsistent. Factors such as peer influence, ease of access, and underestimation of the severity of minor illnesses further complicate this behavior [8]. Such practices are not only risky for personal health but also preserve cycles of irrational drug use, undermining public health efforts to combat antibiotic resistance and medication errors [9, 10]. The primary factors driving self-medication in Libya and globally include prior experience with illnesses, lack of adequate information about diseases, economic challenges, limited time to consult a doctor, and easy availability of medications [11-15]. Previous studies conducted in various countries have shown a growing trend in self-medication. For instance, the prevalence rates of self-medication in Jordan, Egypt, and Ethiopia were reported to be 52.7%, 32.7%, and 70.8%, respectively [16-18]. In Libya, a systematic review study reported that the overall pooled proportion of self-medication of drugs was 53.6% (95% CI: 0.93% - 1.08%). The records ranged from 15.3% (95% CI: 0.61-1.65) in Misurata to 76.6% (95% CI: 0.80-1.25) in Tripoli [13]. Medical students are generally different from other university students as they are exposed to knowledge about diseases and drugs, which makes self-medication easier for them to practice. Therefore, pharmacists and physicians play a crucial role in providing valuable recommendations on the proper and safe use of pharmaceutical drugs and medical devices [19-23]. Therefore, our study was carried out to estimate the prevalence of self-medication and identify its pattern among medical students at the University of Tripoli, Libya.

Materials and methods

Study design, setting, and participants: A cross-sectional study was conducted among undergraduate medical students from the first to the final year at the University of Tripoli, Tripoli, Libya during the period from January to March 2025. All students who agreed to participate and were not suffering from any medical illness were included in this study. We excluded students who had serious illnesses/or were hospitalized during the period of data collection.

Sample size calculation: Considering the prevalence of self-medication practices to be 53.6% as per the earlier reported study [13], the minimum estimated sample size was calculated to be 121 using the formula 4p (1-p)/d2, with a desired confidence limit of 95.0% and relative precision of 5.0%.

Study tool: Data were collected using a pre-designed, semi-structured, self-administered questionnaire comprising 16 questions focused on self-medication. The questionnaire was developed by the research team following a comprehensive review of existing literature [24]. To ensure its validity, the questionnaire was evaluated by experts from two departments (Community Medicine and Pharmacology). The questionnaire was divided into two sections: the first section captured socio-demographic details of the participants, including age, gender, faculty, year of study, residence, family income, and parental education. The second section consisted of nine questions specifically addressing self-medication practices, such as the reasons behind self-medication, the types of substances used (such as pharmaceutical drugs, nutritional supplements, or herbal preparations), patterns of use, the health complaints prompting self-medication, any side effects experienced, and the presence of chronic diseases, if applicable.

Ethical consideration: Written informed consent was secured from all participants, and those who declined to participate were excluded from the study. The objectives, methodology, and potential benefits of the research were clearly explained to the participants. Data collection was conducted anonymously, with the assurance that the information would be used solely for scientific research purposes. Confidentiality and privacy were strictly upheld at all stages of the study. The ethical standards of the research were overseen and approved by the research committee of the Faculty of Medical Technology.

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Statistical analysis: The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 22.0 software (IBM Microsoft). Qualitative variables were described using frequencies and percentages. Additionally, the Chi-square test was employed, while numerical variables were presented as means along with their standard deviations.

Results

A total of 121 (mean age 22.46±1.66 years) participated in this study, with 96(79.3%) being females and 110(90.9%) residing in Tripoli. Most participants were in the 4th year 60(49.6%), followed by the 3rd year 31(25.6%) (**Table 1**). In terms of parental education, 69(57.0%) of fathers and 60(49.6%) of mothers had completed university education, with 63(52.1%) of participants reporting that their family income was just enough, while 49(40.5%) indicated that their income was enough and saving, and 09(7.4%) stated that their income was not enough. For residence, a significant association was observed, indicating that individuals residing in Tripoli were more likely to engage in self-medication compared to those outside Tripoli. Also, the father's education showed a strong association with self-medication, with higher education levels correlating with increased self-medication practices. Mother's education also demonstrated a significant relationship.

Table 1: Self-medication practices across demographic variables

Variables		Have you obtained drugs without a prescription				P-value
		No		Yes		
		n	%	n	%	
Gender	Female	19	19.8	77	80.2	0.166
	Male	2	8.0	23	92.0	
Faculty	Dentistry	2	66.7	1	33.3	0.110
	Medical Technology	12	15.4	66	84.6	
	Medicine	1	33.3	2	66.7	
	Nursing	1	50.0	1	50.0	
	Pharmacy	5	14.3	30	85.7	
Study year	1st year	0	0.0	3	100	0.941
	2nd year	2	25.0	6	75.0	
	3rd year	5	16.1	26	83.9	
	4th year	10	16.7	50	83.3	
	5th year	3	20.0	12	80.0	
	6th year	1	25.0	3	75.0	
Residence	Outside Tripoli	5	45.5	6	54.5	0.010*
	Tripoli	16	14.5	94	85.5	
Family income	Enough and saving	8	16.3	41	83.7	0.912
	Just enough	11	17.5	52	82.5	
	Not enough	2	22.2	7	77.8	
Father education	Basic education	7	31.8	15	68.2	0.001*
	Secondary education	10	33.3	20	66.7	
	High education	4	5.8	65	94.2	
Mother education	Basic education	11	39.3	17	60.7	0.002*
	Secondary education	4	12.1	29	87.9	
	High education	6	10.0	54	90.0	

The prevalence of self-medication was notably high, with 82.6% (n=100) of participants reporting that they had obtained drugs without a prescription. Moreover, the proportion of students in our study who reported using antibiotics without a prescription was 62.0%. The determinants of self-medication were diverse, with the most common reasons being pharmacist advice 52(43.8%), medical knowledge from self-experience and studies 39(32.2%), and recommendations from friends or family members 15(12.4%). When selecting the type of medication, participants were primarily influenced by the commonly used medication 74(61.2%), particularly tablets 19(15.7%), and the price of medication 10(8.3%) (**Table 2**).

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Table 2: Prevalence and determinants of self-medication practices

Variable	n	%
Prevalence of Self-medication	100	82.6
Self-medication with antibiotics	62	51.2
Determinants of self-medication		
An old prescription from a physician	4	3.3
High fees of physicians	6	5.0
Medical knowledge from self-experience and studies	39	32.2
Pharmacist advice	53	43.8
Saves time	4	3.3
Used by friends/family members	15	12.4
Factors affecting the type of selected self-medication		
Form of medicine (tablets)	19	15.7
Pharmaceutical company	18	14.9
Price	10	8.3
The most commonly used medication	74	61.2

As in **Table 3**, the majority (71.9%) reported using pharmaceutical products, making it the most common form of self-medication. Within this category, analgesics were the most frequently used (51.2%), followed by vitamins (31.4%). Other pharmaceutical products, such as antihistamines, antipyretics, anti-diarrhea, and anti-vomiting medications, were used less frequently, each accounting for less than 5.0% of cases.

Table 3: Types of self-medication and pharmaceutical products

Variable	n	%
Type of self-medication		
Herbs	5	4.1
Nutritional supplements	29	24.0
Pharmaceutical products	87	71.9
Type of pharmaceutical products		
Analgesics	62	51.2
Anti-acid	3	2.5
Anti-diarrhea	4	3.3
Anti-vomiting	4	3.3
Antihistamines	5	4.1
Antipyretics	5	4.1
Vitamins	38	31.4

Various health complaints are reported by individuals, with headaches being the most common (80.4%), followed by pain-related issues (79.9%) and respiratory problems (73.2%). Gastrointestinal complaints (60.9%) and skin issues (40.2%) were also frequently reported (**Table 4**).

Table 4: Complaints leading to self-medication

Complaint	n	%
Headache	144	80.4
Pain	134	79.9
Cough, running nose, fever, and bronchial asthma	131	73.2
Vomiting, diarrhea, nausea, and difficulty in swallowing	109	60.9
Hair fall, skin diseases with rash, dandruff, and wounds	72	40.2
Epilepsy, migraine, and faints	40	22.3
Diabetes and hypertension	10	5.6
Reproductive and urinary	13	7.3

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The majority of respondents (71.9%) obtained their medication from pharmacies, while 19.0% relied on home supplies, and 5.0% sourced their medication from primary health care centers. A small proportion (3.3%) acquired medication from friends, and 0.8% reported other sources. In terms of responses to side effects, nearly half of the individuals (49.6%) chose to stop taking the medication, making it the most common reaction. Others sought medical assistance, with 24.0% visiting a private physician, 14.9% going to a primary health care center, and 10.7% consulting a pharmacy. 0.8% reported no side effects or other responses, as shown in **Table 5**.

Table 5: Source of used medication and response to side effects

Variables	N	%
Source of used medication		
Friends	4	3.3
Home	23	19.0
Pharmacy	87	71.9
Primary Health Care Center	6	5.0
Others	1	0.8
Response to side effects		
Consult pharmacist	13	10.7
Consult primary health care physician	18	14.9
Consult a private physician	29	24.0
Stop taking medication	60	49.6
Others	1	0.8

Discussion

In this study, practices towards self-medication were evaluated among medical students at the University of Tripoli. Variables such as gender and family income did not show statistically significant associations with self-medication practices. Differently, in a study conducted among Libyan patients in Tripoli, the prevalence of self-medication was found to be higher in males [7] and also higher in males in a study conducted at both Libyan International Medical University and Benghazi University in Libya [25]. Moreover, no significant relationship was found between both years of education and faculties with the level of self-medication. These findings are in line with a study conducted by Mirdoosti et al. in Iran [26], which examined medical students across different academic years, and found no significant variation in self-medication levels based on the year of education. However, some studies in the literature suggest that self-medication levels tend to rise as students progress through their medical education [6]. For residence, a significant association was observed, indicating that individuals residing in Tripoli were more likely to engage in self-medication compared to those outside Tripoli. Similarly, the father's education showed a strong association with self-medication, with higher education levels correlating with increased self-medication practices. Mother's education also demonstrated a significant relationship, suggesting that higher maternal education levels were associated with a greater likelihood of self-medication. A study involving medical students in Serbia found that a father's lower educational level was associated with self-medication, with this link being attributed to the influence of family attitudes [27].

The prevalence of self-medication in the current study was notably high, with 82.6% (n=100) of participants reporting that they had obtained drugs without a prescription. In agreement with our findings, a high level of self-medication (96.1%) was reported in studies conducted among medical students in Libya, this rate has been shown to vary between 64.7% and 70.6% [28, 29], with overall pooled proportion of self-medication of drugs was 53.6% (95% CI: 0.93%-1.08%), as reported from a systematic review study conducted on over 13 papers from seven cities in Libya [14]. Similarly, research from various countries has consistently shown a

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high prevalence of self-medication among students. For example, studies have reported self-medication rates of 93.0% in Uganda by Awori and Onyango [30], 81.3% in Iraq by Ramadan [31], and 83.8% in Pakistan by Sajjad et al. [32]. The proportion of students in our study who reported using antibiotics without a prescription was 62.0% which aligns with findings from other studies involving medical students in Libya [12, 13, 25]. Similarly, varying levels of self-administration of antibiotics have been observed in studies conducted among medical students in other countries, with rates of 25.0% in Saudi Arabia [33] and 60.8% in Sudan [34]. The main reasons cited by participants for self-medication varied, with the most common reasons being pharmacist advice 52(43.8%), previous knowledge 39(32.2%), and recommendations from friends or family members 15(12.4%). Similarly, a study conducted in Tripoli revealed that 22.4% of participants self-medicated based on pharmacists' advice [7], and 47.7% from previous experience [16].

The current study showed that headache (80.4%), pain (79.9%), respiratory problems (73.2%), and gastrointestinal complaints (60.9%) were the most common symptoms that led to self-medication among students. The most frequently self-administered medications were analgesics (51.2%), followed by vitamins (31.4%). This was consistence with the findings of previous studies in Saudia Arabia, (94.0%), Iran (85.5%), Iraq (92.0%), and Egypt (46.0%) [35-38]. Sources like pharmacies and home remedies, though considered less trustworthy by students, are likely used alongside consulting healthcare professionals. A similar trend was noted in a prior study [39]. Among respondents who experienced side effects, the majority stopped taking the medication (49.6%), while others consulted healthcare professionals. In practice, 58.0% reported discontinuing a medication due to side effects [39]. Stopping medication on their own was linked to higher scores for non-adherent coping strategies. However, most who stopped their medications did so based on a healthcare professional's advice, which is understandable given that many of the side effects were severe enough to warrant medical consultation.

Conclusion: Self-medication was highly prevalent among medical students, with no substantial variation observed based on their years of education. A key factor contributing to increased self-medication was the practice of keeping medications at home. The most common symptoms prompting self-medication were headache, pain, respiratory issues, and stomach complaints, with analgesics and vitamins being the most frequently used drugs. Thus, educational programs promoting responsible self-medication practices be introduced early, starting from the first year of medical education. Highlighting the risks of inappropriate self-medication through such initiatives is expected to foster more responsible behavior among students.

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