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Original article

Self Medication Practice Among Benha University Students (A Comparative Study)

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Abstract

Background: Self-medication (SM) is defined as an effort made by an individual to obtain medication and use it without consultation with a doctor. Self-medication is a worldwide health concern and highly prevalent among university students. **Objective:** To compare between medical and non-medical students regarding knowledge and practice of SM. **Method**: This cross-sectional study was designed using a well-structured and validated questionnaire included 1157 undergraduate Benha University students from the involved four colleges (Medicine, Commerce, Education and Literature). The questionnaire consisted of socio-demographic data, and data about knowledge regarding certain medications and data about SM practice. **Results**: This study revealed that medical students were significantly more knowledgeable about the side effects of analgesics, antibiotics, GIT drugs and anti-cough drugs ($p<0.001$). Self-medication was significantly more prominent among non-medical students. 51.2% of self-medicated students were non-medical student. The most common source for SM was pharmacist's advice (25.9%), followed by self-decision (24.9%). Self-medicated students were significantly older than non-self-medicated students ($p=0.009$). High percentage of non-self-medicated students were at first grade (42.7%). Students suffering from chronic diseases and those having a family member work as heath care provider significantly practice self-medication higher than their peers ($p= 0.016$ and 0.008 respectively). **Conclusions:** Medical students were significantly more knowledgeable about the side effects of specific medications. Self-medication practice was prevalent among the studied participants with a higher percentage among non-medical students compared to medical students.

Key-words: Self-medication; Practice; University; Medical Students; Knowledge.

Introduction:

Self-medication is the use of pharmaceuticals to treat illnesses or symptoms that oneself diagnoses, as well as the sporadic or continuous administration of medications for persistent or recurrent illnesses or symptoms [1].

Globally, SM is being promoted by societal gains in literacy, economic growth, and access to technical innovations, such as social media platforms. Although the WHO promotes appropriate SM for minor illness situations, SM is a problem with significant worldwide implications. Since today's health students will be the future medical professionals, it is important to look into their SM behaviour and take corrective action in order to safeguard others and themselves from inappropriate drug use [1].

The examined literature revealed a significant frequency of pharmaceutical addiction among Egyptians, reaching 86.4% in several Egyptian governorates [2]. Prevalence of SM in university students from the city of Mansoura in Egypt was 62.9% [3]. Also, among medical students at Tanta University in Egypt, About three quarters of the students (74.6%) used SM during COVID 19 pandemic [4]. To overcome this problem, we should study the students' knowledge and pattern of SM practice.

Demographics (predisposing), self-rated health (need factors), cost (enabling factors), and aspects of the health system are determinants which affect the respondents' decision to self-medicate in each situation [5]. Older persons have been found to be more likely than younger people to self-medicate [6,7].Also, higher education may stimulate self-care behaviors, leading to seeking treatment from health professionals or seeking self-treatment [8,9,10].

Medical practitioners and students alike have been reported as persons who often engage in self-medication as a result of a high interest in self-care and knowledge of drugs [11].

Medical students usually differ from non-medical students due to their formal education and clinical training and this is reflected on their knowledge and practice of SM .This research is one of few researches done on medical students in Egypt. There was no comparable research done at Benha University.

To the best of our knowledge, this is the first study that was done at Benha University to compare between medical and non-medical students regarding students' knowledge and practice of SM.

Objective:

To compare between medical and non-medical students regarding students' knowledge and pattern of practice of SM.

Subjects and Methods:

1. **Study design:** This is a cross-sectional study.
2. **Study setting:** This study conducted at Benha University at 4 faculties (Faculty of medicine, Commerce, Education and faculty of Literature)
3. **Study period:** The field work of this study was carried out from the first of September 2023 to the end of January 2024.
4. **Target population of the study:** Undergraduate Benha University students from the involved four colleges who are fulfilling the following inclusion criteria.

Inclusion criteria: undergraduate medical and non-medical Benha university students from the involved four colleges who agreed to participate in the study.

Exclusion criteria: participants who refuse to participate in the study.

5. **Sampling technique:** Colleges were selected by simple random sampling method then study subjects were selected by systematic random sampling.
6. **Sample size:**

Sample size was calculated according to the following formula: $n = \frac{z^2 \times p(1-p)}{SD^2}$, n= minimal calculated sample size. z= standard normal variate at 5% type [I error] = 1.96. P= prevalence of self-medication (62.9%) according to [3]. SD (Standard deviation) = 0.05. The calculated sample size was 362 and increased to 1157 students to improve strength of the study.

7. **Study methods and tools:**
   - A well prepared structured modified online (prepared on google form) questionnaire was used to collect data from the studied participants.
   - The prepared questionnaire was on English language, and translated from English to Arabic by professional translator then back translated to English. A jury of three Public health experts from the Faculty of Medicine assessed the tool for its validity. Pilot study was done on 30 participants .All recommended modifications in the tool were done.
   - Validity was tested using bivariate two tailed correlation and comparing the calculated value with the critical values obtained from R-tables which was 0.062 for df =1000, and level of significance 0.05. According to the results the questionnaire was modified.
   - Reliability of questionnaire was tested using Cronbach alpha test and showed that all parts of questionnaire were reliable (smallest Cronbach alpha was 0.625).
   - The questionnaire includes data about the following topics:
     – Part 1: data about sociodemographic characteristics and health status (11 Q).
     – Part 2: knowledge about specific medication types as analgesics/antipyretics, antibiotics, GIT drugs, anti-allergic drugs, and anti-cough drugs (10 Q) [12].
     – Part 3: data about self-medication practice (2 Q) [12].

Administrative consideration:

After an official permission was obtained, the study setting was visited to get contact with students from different academic years and their leaders. A group discussion was conducted with a group of students in each college visited to illustrate aim and objectives of the study and encourage students to respond to the questionnaire.

Ethical consideration:

– The study was done after approval from the Ethics Committee of the Faculty of Medicine, Benha university {approval code: M.S.17.6.2023}, and after the permission from the Dean of Faculty of Medicine, Education, Commerce, and Literature, Benha University.

– An informed electronic consent was obtained from all participants. It included data about the aim of the work & study design to assure safety and confidentiality.

Data management and statistical analysis: -

The data was analysed using SPSS 27.0 for Windows (SPSS Inc., Chicago, IL, USA). Participants' characteristics were presented using descriptive statistics like frequency (%), mean, and standard deviation. With the use of independent Student's t-test for continuous variables and the X2 test for categorical data, the study questions and characteristics were compared between medical and non-medical students. A significance level of $p<0.05$ was implemented.

Results:

The median age of studied participants was 20.0 (IQR 19.0 -21.0) years, Females represented the higher proportion among the total studied sample (68.4%). 30.7% of the studied group were in the first grade, and 49.3% of them had excellent grade. 78.8% of them didn't have any of their family members work as healthcare worker **(Table, 1).**

This table demonstrates that, medical students were highly significantly more knowledgeable about analgesics/antipyretics side effects, their toxicity, antibiotic resistance and maximum duration of antibiotics intake ($p<0.001$) **(Table, 2).**

This table reveals that, there was a statistically significant difference between medical and non-medical students regarding their knowledge about side effects of GIT drugs ($p<0.001$). 46.0% of medical students knew about their side effects, while only 16.9% of non-medical students knew about them. 56.3% of medical students knew that these medications should be taken before meal, while only 32.3% of non-medical students knew that and the relation was highly significant ($P<0.001$) **(Table, 3).**

There was a highly statistically significant difference between medical and non-medical students regarding Self-medication practice, 51.2% of self-medicated students were non-medical students **(Figure, 1).**

The most common source for SM among the self-medicated students was pharmacists advise (25.9%), followed by self-decision (24.9%), advise from family members or friends (23.5%), and previous prescription (15.7%). With the most common source among medical students was self-decision (15.9%) while the most common source among non-medical students was pharmacists advise (18.6%) **(Table, 4)**

Self-medicated students were significantly older than non-self-medicated ones ($p<0.001$). 23.7% of self-medicated students were at first grade, compared with non-self-medicated students whereas 42.7% of them were at first grade and the relation was significant ($p<0.001$). There was a significant difference between both groups regarding any of family members work as a healthcare worker ($p=0.008$). Students suffering from chronic diseases significantly practice self-medication higher than those not suffering from chronic disease ($p=0.016$) **(Table, 5).**

Table (1): Distribution of socio-demographic characteristics among the studied participants

Variable		Medical students (n=513)	Non-medical students (n=644)	Total participants (n=1157)
		No (%)	No (%)	No (%)
Age Median(IQR)		21.0 (20.0-22.0)	19.0 (18.0-20.0)	20.0 (19.0-21.0)
Gender	**Male**	211 (41.1)	155 (24.1)	366 (31.6)
	Female	302 (58.9)	489 (75.9)	791 (68.4)
Grade of education	**First**	49 (9.6)	306 (47.5)	355 (30.7)
	Second	96 (18.7)	88 (13.7)	184 (15.9)
	Third	145 (28.3)	159 (24.7)	304 (26.3)
	Fourth	124 (24.2)	91 (14.1)	215 (18.6)
	Fifth	99 (19.3)	0 (0.0)	99 (8.6)
Academic achievement in last year	**Failed**	4 (0.8)	1 (0.2)	5 (0.4)
	Acceptable	12 (2.3)	26 (4.0)	38 (3.3)
	Good	33 (6.4)	128 (19.9)	161 (13.9)
	Very good	99 (19.3)	284 (44.1)	383 (33.1)
	Excellent	365 (71.2)	205 (31.8)	570 (49.3)
Place of residence	**Rural**	321 (62.6)	388 (60.2)	709 (61.3)
	Urban	192 (37.4)	256 (39.8)	448 (38.7)
Living with	**With family**	475 (92.6)	638 (99.1)	1113 (96.2)
	With friends	14 (2.7)	1 (0.2)	15 (1.3)
	Alone	21 (4.1)	2 (0.3)	23 (2.0)
	Others	3 (0.6)	3 (0.5)	6 (0.5)
Any of family members work as a healthcare worker	**Yes**	132 (25.7)	113 (17.5)	245 (21.2)
	No	381 (74.3)	531 (82.5)	912 (78.8)

Data are presented as median (IQR) or frequency (%).

Table (2): Comparison between medical and non-medical students regarding perceived knowledge about safety and adverse effects of analgesics and antibiotics

	Knowledge Variables		Medical students	Non-medical students	Total participants	Chi square test (χ^2)	p-value
			N (%)	N (%)	N (%)		
Analgesics/Antipyretics	Do you know analgesics/antipyretics side effects? (n=584)	Yes	155(52.2)	69 (24.0)	224 (38.4)	57.159	<0.001**
		Not sure	119(40.1)	153 (53.3)	272 (46.6)		
		No	23 (7.7)	65 (22.6)	88 (15.1)		
	Do you know maximum dose of these drugs that could be taken in a day? (n=584)	Yes	191(64.3)	201 (70.0)	392 (67.1)	2.168	0.141
		No	106(35.7)	86 (30.0)	192 (32.9)		
	Do you know that overdose causes drug toxicity? (n=584)	Yes	263(88.6)	176 (61.3)	439 (75.2)	64.276	<0.001**
		Not sure	23 (7.7)	43 (15.0)	66 (11.3)		
		No	11 (3.7)	68 (23.7)	79 (13.5)		
Antibiotics	What is the maximum duration of antibiotic intake? (n=378)	1-3 days	77 (43.0)	129 (64.8)	206 (54.5)	18.674	<0.001**
		One week	85 (47.5)	55 (27.6)	140 (37.0)		
		More than one week	17 (9.5)	15 (7.5)	32 (8.5)		
	Do you know about antibiotic resistance? (n=378)	Yes	148(82.7)	50 (25.1)	198 (52.4)	126.65	<0.001**
		Not sure	17 (9.5)	59 (29.6)	76 (20.1)		
		No	14 (7.8)	90 (45.2)	104 (27.5)		

**highly significant p-value at <0.001
This table is illustrated by figure (1)

Table (3): Comparison between medical and non-medical students regarding perceived knowledge about safety and adverse effects of GIT and anti-allergic drugs.

	Knowledge variables		Medical students	Non-medical students	Total participants	Chi-square test (χ^2)	p-value
			N (%)	N (%)	N (%)		
GIT drugs	Side effects of GIT drugs (n=250)	Yes	58 (46.0)	21 (16.9)	79 (31.6)	27.426	<0.001**
		Not sure	41 (32.5)	48 (38.7)	89 (35.6)		
		No	27 (21.4)	55 (44.4)	82 (32.8)		
	Time of taking GIT drugs (n=250)	Yes Before meal	71 (56.3)	40 (32.3)	111 (44.4)	22.897	<0.001**
		After meal	40 (31.7)	40 (32.2)	80 (32.0)		
		No	15 (11.9)	44 (35.5)	59 (23.6)		
Anti-allergic drugs	Side effect of anti-allergic drugs (n=183)	know	28 (34.6)	28 (27.5)	56 (30.6)	3.536	0.171
		Not sure	29 (35.8)	30 (29.4)	59 (32.2)		
		don't know	24 (29.6)	44 (43.1)	68 (37.2)		

**highly significant p-value at <0.001

Table (4): Frequency distribution of sources of self- medication among self-medicated participants

Variables		Medical students	Non-medical students	Total (N=731) (%=100)
		No (%)	No (%)	No (%)
Self-medicated (n=731)	Self-decision	116 (15.9)	66 (9)	182 (24.9)
	Pharmacist from local pharmacy	53 (7.3)	136 (18.6)	189 (25.9)
	Advice from family members or friends	91 (12.4)	81 (11.1)	172 (23.5)
	Previous prescription	64 (8.7)	51(7)	115 (15.7)
	Social media	12 (1.6)	17 (2.3)	29 (4)
	Others(health program and medical advertising)	21 (2.9)	23(3.1)	42 (6)

Data are presented as frequency (%).

Table (5): Comparison between socio-demographic characteristics and disease characteristics regarding practice of self-medication among the studied participants**.**

Variable		Self-medicated (n=731)	Non-self-medicated (n=426)	Chi-square test /Fisher's exact test	p-value
		No (%)	No (%)		
Socio-demographic characteristics					
Age, median (IQR)		20.0 (19.0-21.0)	19.0 (18.0-21.0)	4.884 ●	**<0.001***
Gender	Male	236 (32.3)	130 (30.5)	0.389 ●●	0.533
	Female	495 (67.7)	296 (69.5)		
Grade of education	First	173 (23.7)	182 (42.7)	48.132 ●●	**<0.001***
	Second	124 (17.0)	60 (14.1)		
	Third	218 (29.8)	86 (20.2)		
	Fourth	143 (19.6)	71 (16.7)		
	Fifth	73 (10.0)	27 (6.3)		
Academic achievement in last year	Failed	5 (0.7)	0 (0.0)	7.058 ●●●	0.114
	Acceptable	25 (3.4)	13 (3.1)		
	Good	113 (15.5)	48 (11.3)		
	Very good	235 (32.1)	148 (34.7)		
	Excellent	353 (48.3)	217 (50.9)		
Place of residence	Rural	441 (60.3)	268 (62.9)	0.757 ●●	0.384
	Urban	290 (39.7)	158 (37.1)		
Living with	With family	701 (95.9)	412 (96.7)	1.276 ●●●	0.735
	With friends	9 (1.2)	6 (1.4)		
	Alone	17 (2.3)	6 (1.4)		
	Others	4 (0.5)	2 (0.5)		
Any of family members work as a healthcare worker	Yes	137 (18.7)	108 (25.4)	7.047 ●●	**0.008***
	No	594 (81.3)	318 (74.6)		
Disease characteristics					
Suffer from any chronic disease	Yes	64 (8.8)	21 (4.9)	5.787 ●	**0.016***
	No	667 (91.2)	405 (95.1)		
Types of chronic diseases (n=85)	Cardiac diseases	5 (7.8)	1 (4.8)	4.978 ●●	0.404
	Blood diseases	7 (10.9)	1 (4.8)		
	Psychological diseases	4 (6.3)	3 (14.3)		
	Hypertension	3 (4.7)	1 (4.8)		
	Diabetes	8 (12.5)	0 (0.0)		
	Others	37 (57.8)	15 (71.4)		
Duration of chronic disease (n=85) *	Less than 1 year	4 (6.3)	3 (14.3)	2.080 ●●	0.412
	1-2 years	12 (18.8)	5 (23.8)		
	More than 2 years	48 (75.0)	13 (61.9)		
Place of health center in relation to place of residence	Near home	222 (30.4)	109 (25.6)	4.048 ●	0.132
	Within the scope of the village or city	422 (57.7)	254 (59.6)		
	In another village or city	87 (11.9)	63 (14.8)		

●Mann-Whitney U test, ●●Chi-square test, ●●●Fisher exact test, *indicates significant p-value at 0.05, Self-medicate means students who self-medicate to at least one of the five drug categories under the study, non-self-medicate means never self-medicate to any of the five drug categories, *indicates significant p-value at 0.05.

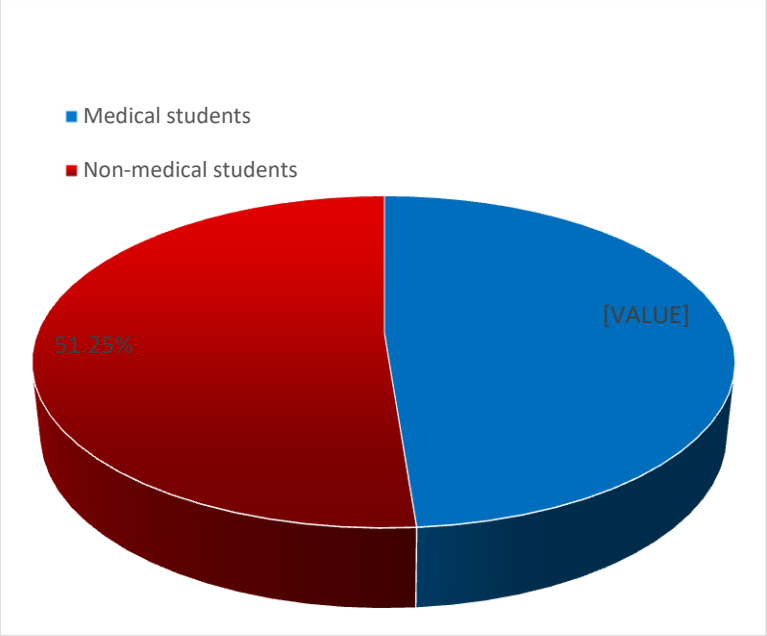

Figure (1): Frequency distribution of medical and non-medical students according to self-medication practice

Discussion:

World Health Organization (WHO) has defined SM as the use of drugs to treat self-diagnosed disorders or symptoms or, the intermittent or continued use of prescribed drugs for chronic or recurrent disease or symptoms [13]. Medical students usually differ from the general population in their knowledge and practice of SM due to their formal education [14].

This study revealed that medical students were significantly more knowledgeable about the side effects of analgesics, antibiotics and GIT drugs compared to non-medical students($p<0.001$). This can be attributed to their medical education and training.

In agreement with our study, this difference is critical, as highlighted by a study, which found that medical education significantly increases awareness of pharmacological risks [15].

Conversely, another study argued that non-medical students could possess similar knowledge levels through targeted health education initiatives, challenging the notion of inherent knowledge disparities [16].

This study clarified that medical students were more knowledgeable about antibiotic resistance and the maximum dosage and duration of antibiotic use.

Similarly, a study conducted in Thiland found that health science (medical) students had superior knowledge of proper antibiotic use and were less likely to engage in antibiotic misuse than non-health science students [17].

On the other side, another study claimed that medical students were not able to use antibiotics appropriately due to gaps in knowledge and a lack of clinical skills [18].

The study found a statistically significant difference between medical and non-medical students regarding their knowledge of the side effects of anti-cough drugs, dependence on these drugs. Medical students were more informed in all these aspects ($p < 0.001$ and $p = 0.011$ respectively).

Formal education and training of medical students on drug safety contributes to this significant difference in knowledge.

In this current study, Self-medication was significantly more common among non-medical students, among the students who self-medicated, 51.2% were not medical students.

The phenomenon of self-medication being more common among non-medical students compared to their medical counterparts can be attributed to several interrelated factors, including knowledge gaps, health beliefs , accessibility, and behavioral tendencies.

Other studies revealed that no significant difference in self-medication practice between medical and non-medical students such as an Iranian study conducted at four healthcare and non-healthcare universities in India and Concluded that self-medication is common among both medical and non-medical students. [19 and20].

In agreement with the current study, a study conducted in Ethiopia among medical and non-medical students to assess practice of self medication by taking history of medication use in the past 12 months, which revealed that the percentage of self-medication was 59.7% among medical students and 69.0% among non-medical students [21].

On contrary, an Egyptian study reported that the percentage of self-medication was significantly higher in the medical sector than the non-medical one (72.4% and 52.6%, respectively) [3].

One of the primary reasons that non-medical students engage in self-medication more frequently is a lack of comprehensive knowledge regarding medications and their appropriate use. Medical students were more knowledgeable about rationale use of medicine and have a better health beliefs which necessarily reflected on their SM practice. In contrast, this knowledge gap can result in non-medical students underestimating the potential risks associated with self-medication, such as incorrect dosages, inappropriate drug choices, and adverse reactions. Their lack of training in recognizing when to seek medical help may further exacerbate the issue.

Regarding the sources of self-medication, in this current study, the most common source for SM among the self-medicated students was pharmacist's advise (25.9%), followed by self-decision (24.9%).

In agreement with this study, a study conducted on Jordanian adults reported that, most of the participants obtained information about SM by asking the pharmacist inside the pharmacy (58.8 %) and by searching the internet (30.9 %)[22].

Also, a cross-sectional study of antibiotic dispensing was carried out to describe the pattern of antibiotics dispensing in 36 pharmacies in greater Cairo, Egypt. They found that 23.3% of the recorded antibiotics were dispensed upon pharmacist’s recommendation in the studied pharmacies and 13% upon patient request[23].

This study clarifies that, self-medicated students were significantly older than non-self-medicated students (p=0.009). 23.7% of self-medicated students were at first grade, compared with non-self-medicated students whereas 42.7% of them were at first grade and the relation was significant (p<0.001). There was a significant difference between both groups regarding any of family members work as a healthcare worker (p=0.008). also students suffering from chronic diseases significantly practice self-medication higher than those not suffering from chronic disease(p=0.016).

The variation in percentage of self-medication across different studies and populations can be attributed to several possible causes such as socioeconomic factors and individual-level factors. An individual's propensity to self-medicate may be impacted by personal traits like age, degree of education, and health literacy. People who have completed more years of schooling may be less prone to self-medicate and more likely to visit a doctor when they're sick.

In agreement with this study, a Study showed increasing self-medication with age [24 and 25].

In contrast to this study , a study reported that medical students and professionals have been reported as persons who often engage in self-medication [11]. Also, another study reported increasing self-medication with being medical student [26].

Conclusion:

There is a worrying trend towards SM among university students. This trend is observed among both medical and non-medical students. When compared to medical students, the percentage among non-medical students is higher. The maximum dosage, side effects, and overdose risks were all significantly more well-known to medical students.

The most common source for SM was pharmacist's advise, followed by self-decision. Older students, students suffering from chronic diseases and those having a family member work as health care provider significantly practice self-medication higher than their peers.

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