A Glance from Inside at the Pattern of Self-medication among Secondary School Students in Baghdad, Iraq

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ABSTRACT

This study aimed to assess the prevalence, factors, and conditions linked to self-medication with drugs and dietary supplements among secondary school students. A randomized cohort cross-sectional study was carried out in two directorates in Baghdad. Participants were 604 secondary school students. A semi-structured, self-administered questionnaire was developed by the researchers, composed of questions related to the socio-demographic characteristics and the self-medication options. The overall prevalence of self-medication was 61.3%. The majority of participants practicing self-medication were girls (57.3%). Male gender, living in two-parent families, having a high parental educational level, and high standards of living were found to be protective factors. The most frequently used medications were analgesics (74.9%), whereas the most frequently used supplements were vitamins (38.9%). Family and pharmacist were the greatest sources of self-medication. The prevalence of self-medication among Iraqi secondary school students is high, particularly for analgesics, vitamins, and antibiotics. An urgent need to raise students' awareness regarding the appropriate use of medications and dietary supplements from reliable sources to control their use and prevent adverse effects.

Keywords: Self-medication, Adolescents, Secondary school students, Medicines, Iraq.

INTRODUCTION

In the Middle East region, there is a strong association between adolescence and a high risk of self-medication, which may lead to serious health problems. Many studies highlighted the high prevalence among adolescents, with higher usage of analgesics, antipyretics, and antibiotics[1,2]. Beyond conventional medications, adolescents and young adults frequently use dietary supplements (DS), often to enhance quality of life or academic performance rather than to treat a diagnosed condition[3].

The increased risk of self-medication among adolescents in this region is driven by multiple factors. These include easy access to pharmacies and over-the-counter drugs, weak enforcement of prescription regulations, particularly for antibiotics, and the influence of peers and family. Furthermore, low medication literacy and cultural norms that normalize self-treatment for minor ailments contribute to this practice[4]. A study found that DS users may experience adverse events, highlighting safety concerns and emphasizing the need for rigorous monitoring and regulatory policies[5]. The unsupervised use of pharmaceuticals increases the risk of incorrect dosing, drug interactions, and masking underlying diseases[6], and the development of antimicrobial resistance[7], especially when antibiotics are used without a prescription. The excessive consumption of certain vitamins and minerals could have deleterious consequences on the health and development of individuals and populations[8]. The excessive or inappropriate intake of DS used for weight loss, muscle building, and energy involves increased risks for severe medical events compared with vitamins[9] or interferes with prescribed medications.

The misuse of medications and DS contributes to a field of interest because of their potential impact on disease. However, in Iraq, surveys on the prevalence and determinants of their use primarily focus on university students and community samples[10,11], demonstrating that men and women mainly use vitamins D and C, herbs, and that a significant number of pharmacists dispense antibiotics without prescriptions. At the same time, there is a limited number of studies conducted on adolescents.

The objective of the current study is to evaluate the prevalence of self-medication and/ or dietary supplements, taking into consideration their associated risk factors, among adolescent students in Baghdad, Iraq.

SUBJECTS AND METHODS

A randomized cohort cross-sectional study was conducted among a sample of secondary school students in Baghdad. From February 2024 to October 2024, using a random sampling table and a self-administered questionnaire (Arabic version). This study was approved by the institutional Ethical Committee in the College of Pharmacy at the University of Baghdad.

Baghdad, the capital of Iraq, is a big city divided by the Tigris River into two banks. The eastern one is called Rusafa, and the western one is called Karkh. Each bank is subdivided into three directorates of education. The selected sample (604 students) was collected from 12 randomly selected schools from two directorates in Baghdad: the Primary Karkh Directorate of Education and the Primary Rusafa Directorate of Education. Each of the selected directorates involves public and private schools in urban and rural regions for both boys and girls.

The study was conducted in secondary schools (private and public) for boys and girls in Baghdad City.

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The eligible participants were adolescents of both sexes, aged 14-19 years, without exclusion of race or ethnicity. Students unwilling to participate in the study, evening-studies schools, Integrated schools (different age groups in the same class), mixed schools (boys and girls in the same class), and private schools in rural areas (a limited number in these areas) were excluded from the study.

The sample size (n) had been calculated based on a Finite Population Corrected Sample Size Formula. To calculate the sample size, the prevalence of self-medication from a study in Anbar city of Iraq, 0.73 was used[12].

$n = \{N , z^2 , p(1-p)\} \{(N-1)d^2 + z^2 p(1-p)\}$

The assumptions used are: a z value of 1.96 at a 95% confidence interval (CI), and a margin of error (d) is 5%

d marginal error of 5%; p proportion; n sample size.

The sample (384) was increased to 604 (from 12 schools) to be more representative. The total population of students in Baghdad, according to a report prepared by the Ministry of Education in collaboration with the Central Statistical Organization, is approximately 847,067.

Sampling Strategy: Twelve schools were randomly selected (Google random number generator) from each zone (i.e., rural (public) and urban) and type (public and private) within the chosen directorate. All available students were invited to participate in this study voluntarily. Two rural schools were not included and replaced with two other schools because one of them had insufficient numbers of students, and the second did not meet the eligibility requirements of the study.

The primary data collection instrument was a semi-structured, self-administered questionnaire. It was developed following an extensive review of the literature on self-medication and supplement use among adolescents[13-15]. To ensure content validity, the questionnaire was reviewed by a panel of three experts in clinical and social pharmacy, and a consensus was reached on the essentiality of all items. The instrument was then translated into Arabic and approved by three professors from the scientific committee of the Department of Clinical Pharmacy, University of Baghdad. The questionnaire was anonymous to avoid causing any embarrassment to the responders.

A pilot study was conducted on 25 students (none of whom were included in the main study sample) to assess clarity, comprehensibility, and cultural appropriateness, leading to minor refinements in wording. The questionnaire was approved by the Scientific Committee of the Department of Clinical Pharmacy, University of Baghdad.

The questionnaire comprised two distinct sections. Section A included 10 items, gathering demographic information from participants. Section B assessed self-medication patterns over the past 12 months through 10 questions designed to capture participants' self-medication behaviors, including whether they had used drugs or DS without a prescription, the specific conditions, duration, and frequency of use, and the sources (e.g., community pharmacies, friends, family). After obtaining the required official approvals and permissions, the researcher introduced herself to the participants, explained the study's aim, and provided a complete description. The students were invited to participate voluntarily. Verbal consent was obtained from those willing to participate, after which they were given the paper-based Arabic questionnaire to complete and return on the same day. Each questionnaire took about 10-15 minutes to complete.

The current study was ethically approved by the Ethical Committee at the College of Pharmacy/University of Baghdad (Approval no. RECAUBCP5220240bR, Date 10th January 2024), which functions as the Institutional Review Board [IRB] for research involving human subjects. All participants were explicitly informed about the objectives of the study thoroughly and clearly, and provided verbal consent.

Approval was also taken from the Primary Karkh Directorate of Education (Approval no. 64610, Date 14th Dec. 2023) and the Primary Rusafa Directorate of Education (Approval no. 757/2/14, Date 29 Feb.2024), which acts as the in loco parentis for enrolled participants. An obtained verbal consent in lieu of written consent to respect cultural sensitivities, ensuring participant comfort while maintaining ethical standards. The consents were witnessed by the administration of the school (manager and assistant manager), as they represent the guardians of the students during the school hours. Anonymity was guaranteed for all questionnaire responses to protect privacy.

Data were anonymized using a unique serial code for each questionnaire. Results are presented as numbers and percentages. The data were analyzed using a difference between percentages test for categorized data using an Excel 10 software (Microsoft Office Excel 2010, Microsoft Richmond, CA, USA) and the Statistical Package for the Social Sciences version 21 (SPSS v. 21) software (IBM compatible, Microsoft, Illions, USA). A P-value less than 0.05 was set as a cutoff point for statistical significance.

RESULTS

Self-medication was practiced by 370 (61.3%) students, significantly higher than non-users (38.7%) (P<0.001). Females reported significantly higher self-medication than males (P<0.001). Obesity was significantly associated with self-medication (P=0.021), although the proportion of obese self-medication users was lower than that of non-users. Living conditions showed inconsistent patterns, with lower self-medication rates among students living with both parents. Higher parental education was associated with lower self-medication rates, while a lower standard of living was a significant predictor of self-medication behavior (p=0.008), (Table 1).

Self-medication includes therapeutic drugs and dietary supplements. Analgesics were the most commonly used drugs, followed by vitamins, antimicrobials, dermatological agents, anti-allergics, and herbal medicine (Figure 1).
The four most commonly used nutrient supplements were omega-3 (26.5%), vitamin D3 (23.5%), multi-vitamins (21.0%), and vitamin C (8.5%), (Figure 2).

The portal of access to these medicines and DS showed a wide range of sources. The commonest portal of access were family and pharmacists. In the urban area, the students got the medicines from their families, which constitutes 34.1 % compared with 20.8% in the rural area; the difference is significant (P=0.003), (Table 2).

This study disclosed that there were certain factors that forced the adolescents to take the medicines by themselves. Table 3 shows that girls showed a significantly higher tendency not to mention a specific cause when compared to boys (19.8% vs 11.4%, P=0.03). additionally, adolescents who lived in the Rusafa district significantly did not clarify their motivation for obtaining medicines and treating themselves (22.6% versus 10.9%, P= 0.002). Students living in urban areas reported higher self-medication than those in rural areas (36.3% vs 25.7%, P=0.034) and were more likely to take medicines without a clear purpose. Public

Table 1. Comparison between self-medication users and non-users students in the socio-demographic characteristics.

Characteristics	Categories	Total (n = 604)	Self-medication		P-value <0.001*
			Non-users n=234 (38.7%) No. (%)	Users n=370 (61.3%) No. (%)	
Sex	Boys	296 (49)	138 (59.0)	158 (42.7)	<0.001*
	Girls	308 (51)	96 (41.0)	212 (57.3)	
Body mass index (kg/m²)	Underweight (≤18)	58 (9.6)	23 (9.8)	35 (9.5)	0.903
	Healthy weight (18-24.99)	356 (58.9)	130 (55.6)	226 (61.1)	0.181
	Overweight (25-29.99)	94 (15.6)	32 (13.7)	62 (16.8)	0.307
	Obesity (30-30.99)	68 (11.3)	35 (15.0)	33 (8.9)	0.021*
	Severe obesity (≥40)	28 (4.6)	14 (6.0)	14 (3.8)	0.212
Scores of final year intermediate school	80-99	169 (28.0)	69 (29.5)	100 (27.0)	0.505
	60-79	402 (66.6)	152 (65)	250 (67.6)	0.510
	55-59	33 (5.5)	13 (5.6)	20 (5.4)	0.916
Living conditions	With parents	497 (82.3)	203 (86.8)	294 (79.5)	0.022*
	One of the parents	55 (9.1)	14 (6.0)	41 (11.1)	0.034*
	With relatives	5 (0.8)	3 (1.3)	2 (0.5)	0.286
	With relatives and parents	47 (4.8)	14 (6.0)	33 (8.9)	0.195
Physical activity	<3h/ week	189 (31.3)	69 (29.5)	120 (32.4)	0.454
	≥3h/week	199 (32.9)	80 (34.2)	119 (32.2)	0.611
	No physical activity	216 (35.8)	85 (36.3)	131 (35.4)	0.822
Smoking behavior	Former	21 (3.5)	6 (2.6)	15 (4.1)	0.330
	Active	28 (4.6)	13 (5.6)	15 (4.1)	0.396
	Intermittent	41 (6.8)	12 (5.1)	29 (7.8)	0.198
	Non-smoker	514 (85.1)	203 (86.8)	311 (84.1)	0.417
Paternal educational level	Postgraduate	110 (18.2)	44 (18.8)	66 (17.8)	0.756
	Bachelor	215 (35.6)	96 (41.0)	119 (32.2)	0.028*
	Secondary school	204 (33.8)	72 (30.8)	132 (35.7)	0.215
	Primary school	65 (10.8)	19 (8.1)	46 (12.4)	0.097
	Illiterate	10 (1.7)	3 (1.3)	7 (1.9)	0.575
Maternal educational level	Postgraduate	71 (11.8)	37 (15.8)	34 (9.2)	0.014*
	Bachelor	176 (29.1)	74 (31.6)	102 (27.6)	0.292
	Secondary school	197 (32.6)	68 (29.1)	129 (34.9)	0.139
	Primary school	130 (21.5)	45 (19.2)	85 (23.0)	0.269
	Illiterate	30 (5.0)	10 (4.3)	20 (5.4)	0.545
Standard of living	High	112 (18.5)	48 (20.5)	64 (17.3)	0.325
	Moderate	481 (79.6)	186 (79.5)	295 (79.7)	0.953
	Low	11 (1.8)	0 (0.0)	11 (3.0)	0.008*

The results are expressed as numbers (percentages). P-values were calculated using a difference between percentages test. * Significant difference (P<0.05). Using a single drug is considered self-medication by users.

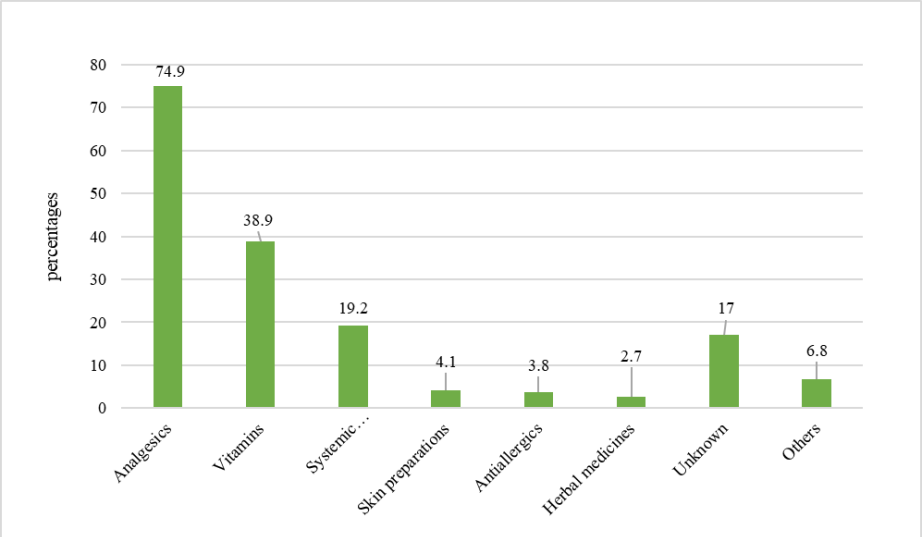

Figure 1. Distribution of self-medication users according to the pharmaceutical category of medicines. Others: Sedative/ hypnotics, drugs for stomach aches, hormones, drugs for obesity, beta-blockers, drugs for eye conditions.

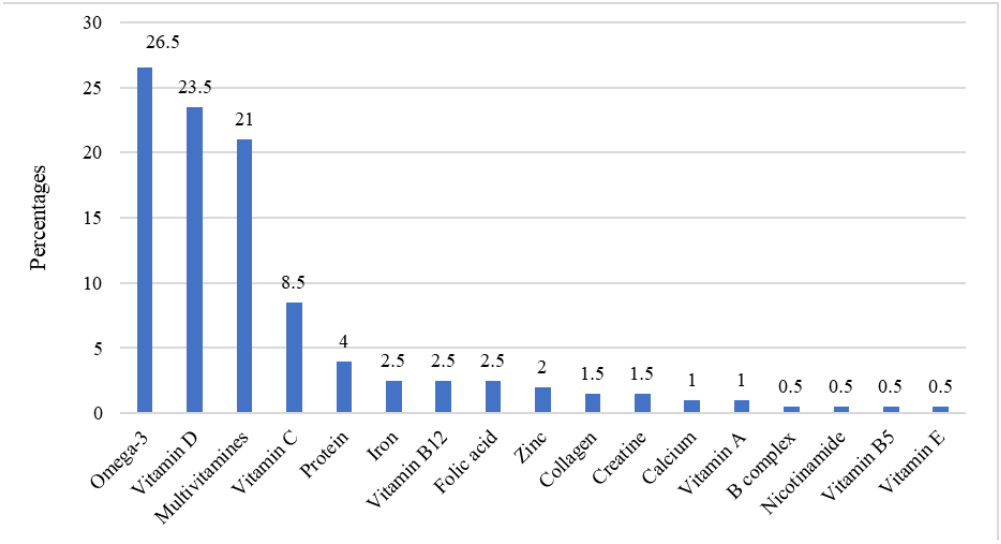

Figure 2. Distribution of self-medication users according to the dietary supplements.

Table 2. The access portal for handling the medicines and nutrient supplements.

Portal	Gender		District		Residency		School category	
	Boys (n=158) No.(%)	Girls (n=212) No.(%)	Karkh (n=202) No.(%)	Rusafa (n= 168) No.(%)	Rural (n=144) No.(%)	Urban (n=226) No.(%)	Public (n=304) No.(%)	Private (n=66) No.(%)
Internet	5 (3.2)	11 (5.2)	11 (5.4)	5 (3.0)	5 (3.5)	11 (4.9)	13 (4.3)	3 (4.5)
Friends	8 (5.1)	1 (0.5)	6 (3.0)	3 (1.8)	4 (2.8)	5 (2.2)	7 (2.3)	2 (3.0)
Relatives	6 (3.8)	11 (5.2)	10 (5.0)	7 (4.2)	7 (4.9)	10 (4.4)	15 (4.9)	2 (3.0)
Family (Parent)	40 (25.3)	67 (31.6)	60 (29.7)	47 (28.0)	30 (20.8)	77 (34.1)	86 (28.3)	21 (31.8)
P-value	0.187		0.718		**0.003***		0.577	
Gym	7 (4.4)	1 (0.5)	6 (3.0)	2 (1.2)	2 (1.4)	6 (2.7)	5 (1.6)	3 (4.5)
Beauty centers	0 (0.0)	2 (0.9)	2 (1.0)	0 (0.0)	1 (0.7)	1 (0.4)	2 (0.7)	0 (0.0)
Herbal shops	5 (3.2)	11 (5.2)	11 (5.4)	5 (3.0)	9 (6.3)	7 (3.1)	16 (5.3)	0 (0.0)
Nurses	10 (6.3)	8 (3.8)	10 (5.0)	8 (4.8)	7 (4.9)	11 (4.9)	16 (5.3)	2 (3.0)
Pharmacists	115 (72.8)	140 (66.0)	140 (69.3)	115 (68.5)	100 (69.4)	155 (68.6)	214 (70.4)	41 (62.1)
P-value	0.163		0.868		0.871		0.187	
Himself/herself	3 (1.9)	12 (5.7)	13 (6.4)	2 (1.2)	8 (5.6)	7 (3.1)	13 (4.3)	2 (3.0)
Others	4 (2.5)	12 (5.7)	5 (2.5)	11 (6.5)	4 (2.8)	12 (5.3)	12 (3.9)	4 (6.1)

The results are expressed as numbers (percentages). P-values were calculated using a Difference between Percentage test. * = Significant difference (P<0.05). Others: unspecified

Table 3. Interactions between motivation for handling medicines and dietary supplements, and the characteristics of self-medication in adolescents.

Motivation	Gender		District		Residency		School type	
	Boys (n=158) No. (%)	Girls (n=212) No. (%)	Karkh (n=202) No. (%)	Rusafa (n=168) No. (%)	Rural (n=144) No. (%)	Urban (n=226) No. (%)	Public (n=304) No. (%)	Private (n=66) No.(%)
Experience	52 (32.9)	67 (31.6)	72 (35.6)	47 (28.0)	37 (25.7)	82 (36.3)	97 (31.9)	22 (33.3)
P-value	0.791		0.120		**0.034***		0.826	
Advice	57 (36.1)	69 (32.5)	74 (36.6)	52 (31.0)	49 (34.0)	77 (34.1)	105 (34.5)	21 (31.8)
P-value	0.47		0.258		1.0		0.67	
Financial	4 (2.5)	8 (3.8)	7 (3.5)	5 (3.0)	6 (4.2)	6 (2.7)	12 (3.9)	0 (0.0)
P-value	0.47		0.781		0.449		**0.006***	
Purposeless	59 (37.3)	66 (31.1)	68 (33.7)	57 (33.9)	40 (27.8)	85 (37.6)	101 (33.2)	24 (36.4)
P-value	0.213		0.968		**0.052***		0.624	
Unspecified	18 (11.4)	42 (19.8)	22 (10.9)	38 (22.6)	27 (18.8)	33 (14.6)	50 (16.4)	10 (15.2)
P-value	**0.03***		**0.002***		0.293		0.810	

The results are expressed as numbers and percentages. P-values were calculated using a difference between percentages test. *Significant difference (P<0.05). Many students responded with more than one motivation type. Purposeless: the condition is not serious for visiting healthcare. Unspecified: personal motivation was not clarified.

school students were more likely than private school students to self-medicate for financial reasons (3.9% vs 0%, P=0.006).

DISCUSSION

Self-medication among adolescents is an underexplored public health issue, particularly in low- and middle-income countries such as Iraq. Adolescence is a vulnerable period of risky health behaviors, and easy access to medicines and supplements, combined with limited health literacy, increases the risk of inappropriate use. Despite its potential health consequences, data on self-medication in secondary school students are scarce. This study addresses this gap by providing valuable data on self-medication practices among Iraqi secondary school students.

The results of this cohort study indicated a widespread practice of self-medication (61.25%) among the Iraqi secondary school students in the past year. A similar prevalence was reported among university students in Egypt (62.9%)[16], suggesting this is a regional pattern among Arab youth despite differences in educational level. This similarity may be attributed to shared cultural norms and healthcare system challenges common to both countries. Overcrowded public health facilities, long waiting times, and a shortage of medical personnel often make seeking formal care impractical, thereby encouraging self-treatment for minor ailments. In contrast, studies among secondary school students in other countries, such as in Taiwan (45.8%)[6] and in Ethiopia (48.3%)[17]. reported lower prevalence rates. This higher prevalence in Iraq could reflect the weaker enforcement of POM regulations, or the limited access to primary health care services, this easy access to medicines and cost barriers encourages people to self-medicate.

A systematic review of adolescents' self-medication, encompassing 163 global studies, found prevalence estimates varying widely, ranging from 2%–92%[18]. The present finding of 61.25% falls within this broad spectrum.

Female students reported higher self-medication use than males, consistent with findings from Eritrea, where females were 2.8 times more likely to self-medicate[19]. In contrast, studies from Saudi Arabia and Nepal reported no significant gender differences[20,21]. These gender differences may be explained by conditions such as dysmenorrhea, with adolescents often managing recurrent menstrual pain without medical consultation. Although obesity was significantly associated with self-medication, obese adolescents reported lower rates, possibly due to greater healthcare contact, parental supervision, and increased caution regarding medication use and side effects. This finding contrasts with the evidence from a study conducted in Jordan, where most participants used herbal and dietary products as part of their weight-control program, despite believing these products to be ineffective when used alone[22]. This difference may be due to the Jordanian study focusing on herbal and dietary products, which are considered more as lifestyle aids than medications.

The observed lower self-medication rates among students living with both parents compared with single-parent students are similar to another study, which concluded that adolescents with low parental support experience self-medication behaviors[23]. This may be explained by greater parental supervision, socioeconomic stability, better healthcare access, and healthier family dynamics. Higher parental education was associated with lower self-medication among students, consistent with findings from Saudi Arabia[24], and Nigeria[25]. This may reflect better health literacy, greater awareness of medication, and a stronger preference for professional medical advice rather than allowing unsupervised self-treatment.

The prevalence of self-medication was significantly higher in the present study among students with a low standard of living compared to those with high socioeconomic status. Students from high-income families have easier access to formal healthcare services. In contrast, those with lower incomes may be restricted by cost. This reflects a balance between the affordability of medicines and the avoidance of medical expenses[26].

Analgesics were the most commonly used medication (74.9%), while herbal products were the least used, which is comparable to the findings of several studies carried out in Saudi Arabia[27], and Eritrea[19]. Their widespread OTC availability, perceived safety, and low cost likely encourage unsupervised use.

Vitamins were the second most commonly used self-medication (38.9%), consistent with studies from Kuwait[5], and Saudi Arabia[28]. Although there is unsupervised use of vitamin D, the prevalence of vitamin D toxicity is relatively low[29], and this could explain why people tend to self-medicate with vitamins. Other reasons could be the aggressive marketing of social media that claims vitamins as "boost immunity," "improve beauty," or "enhance energy"[30].

In this study, 19.2% of students reported self-medicating with antibiotics, lower than the rates reported among health science students in Baghdad[1], Anbar[12], and Mosul[31]. In Iraq, the misuse of antibiotics is widespread due to poor public knowledge about when antibiotics are warranted[32]. Furthermore, the insufficient control over non-prescription dispensing, even among students aware of misuse risks, is a contributing factor. Yawuz et al. found that many community pharmacies dispense antibiotics without prescriptions[33]. Limited public awareness leads to their use for viral, contributing to bacterial resistance and adverse effects, with multidrug-resistant strains reported in several regions of Iraq[34,35].

Antibiotic misuse is common in Middle Eastern countries, with over 75% prevalence in Iraq and Yemen[32,36], compared to 40.4% in Jordan[37] and 15.3% in Saudi Arabia[38]. Factors include erratic enforcement of pharmaceutical laws, easy access to antibiotics, conflict political instability, and limited access to healthcare professionals, especially in rural areas.

Omega-3 was the most widely used supplement by students (26.5%), driven by perceived benefits for heart and inflammation[39,40], and the widespread OTC availability as "heart healthy", "brain supporting" or "anti-inflammatory". However, evidence for cognitive benefits in children and adolescents is mixed[41], with some studies, including one from France, showing no effect on mild ADHD symptoms[42]. A recent systematic review found that omega-3 had significantly higher odds of occurrence of diarrhea, dysgeusia, and bleeding tendency when compared with placebo therapy[43].

Vitamin D use was high in this study, reflecting a global rise in supplementation due to widespread deficiency. Jebur et al. reported higher deficiency in adults (77%-87%) than in children and adolescent (23%-22%)[44]. Many individuals are categorized as "deficient" based on labs, despite few clinical symptoms, as early deficiency is often subtle and balanced diets or fortified foods may prevent overt disease.
Vitamin D use should be monitored to meet needs and avoid toxicity. It is essential for calcium absorption, bone, and immune function, with a deficiency causing rickets or osteomalacia. Evidence on supplementation is mixed: large trials show limited effects on cancer, cardiovascular disease, or mortality[45], though vitamin D with calcium may reduce fractures[46]. Optimal levels and benefits of supplementation remain unclear, warranting further studies[47].

The current study showed that there is a wide range of sources of accessing the drugs and DS; however, family and the community pharmacist are the major ones. This result is consistent with a systematic review, which identifies 72 papers about self-medication in the Middle East, and concluded that pharmacists, friends, and parents are the main sources of self-medication[4].

In minor illnesses, there is a strong familial influence on health decisions. In addition to that, family members may provide leftover drugs, recommend previously used treatment, or share medications. Pharmacists likewise are a major source of self-medication, especially in countries where regulation enforcement is weak, where community pharmacists dispense medicine without prescriptions, especially for minor conditions. The current study found that schools from urban areas in Baghdad depend more on families as a source of self-medication than those living in rural areas.

Inconsistent with an Indian study where pharmacies were the primary source of medication, especially in rural areas (48.5% rural vs. 39% urban, $P < 0.05$). However, urban participants were more likely to visit primary health centers (11% urban vs. 1.5% rural), possibly reflecting better access to formal healthcare services[48]. Self-medication was mainly driven by prior experience, external advice, financial reasons, and the perception that this behavior was not serious.

Girls were less likely to disclose their motivations, possibly due to social and cultural factors, which limit this study and suggest the need for more in-depth methods. In contrast, boys were more often considered their condition too minor to seek medical care. Adolescents in Rusafa were significantly less likely to report reasons for self-medication, whereas those in Karkh tended to rely on prior experience, though not significantly. The reasons for these differences are unclear despite similar district characteristics, indicating a need for further investigation.

Students residing in urban areas reported higher self-medication, often relying on prior experience, and perceiving conditions as minor, compared with students in rural areas. This aligns with an Indian study showing a higher prevalence in urban areas, although urban residents were more aware of potential risks[48]. Greater pharmacy access, social media influence, and urban social environments may contribute to these findings.

Students from public schools were significantly more likely than those from private schools to cite financial reasons for self-medication, suggesting that economic constraints may influence healthcare-seeking behavior and encourage reliance on self-treatment rather than formal medical services. The limitations of this study are first, using self-reported questionnaires introduces bias, particularly social desirability and misunderstanding of questions. Second, challenges in obtaining parental consent and stigma around health topics may have reduced participation rates and affected response honesty.

CONCLUSION

In conclusion, self-medication is highly prevalent among Iraqi secondary school students. Particular concern for analgesics, vitamins, and antibiotics. Male gender living in two-parent families, with high parental educational level, and high standards of living are considered protective factors against self-medication. Families and pharmacists are the highest access portal for handling medicines and DS. Girls are significantly predominant in taking DS.

Authorship Contribution: Both authors of this research contributed equally to the conceptualization, design, analysis, interpretation of data, writing, and review of the manuscript. They have thoroughly reviewed and approved the final version of the manuscript.

Potential Conflicts of Interest: None

Competing Interest: None

Acceptance Date: 20 January 2026

REFERENCE

1. Ahmed FT, Ali GYM. Evaluation of self-medication among Iraqi pharmacy students. JIDhealth 2019;2(2):108–12.
2. Al-Ameri RJK, Abd Al-Badri HJ, Lafta RK. Prevalence of self-medication among university students in Baghdad: a cross-sectional study from Iraq. EMHJ 2017;23(2):87–93.
3. Marouf BH, Ghafour Hama Saeed A, Othman Z, et al. Awareness and Frequency of using Lifestyle Medications among University Students in Kurdistan Region-Iraq. Iraqi J Pharm Sci 2023;32(1):185–93.
4. Khalifeh MM, Moore ND, Salameh PR. Self-medication misuse in the Middle East: a systematic literature review. Pharmacol Res Perspect 2017;5(4).
5. AlTarrah D, ElSamra Z, Daher W, et al. A cross-sectional study of self-reported dietary supplement use, associated factors, and adverse events among young adults in Kuwait. J Health Popul Nutr 2024;43(1):117.
6. Lee C-H, Chang F-C, Hsu S-D, et al. Inappropriate self-medication among adolescents and its association with lower medication literacy and substance use. PLoS One 2017;12(12):e0189199.
7. Al-Jumaili AA, Ahmed KK. A review of antibiotic misuse and bacterial resistance in Iraq. EMHJ 2024;30(10):663–70.
8. Risk of excessive intake of vitamins and minerals delivered through public health interventions - current practices and case studies. WHO 2017.
9. Staynova R, Yanachkova V. Weight management strategies and food supplement intake among Bulgarian adults: results of a national survey. Pharmacia 2023;70(4):1119–26.
10. Mohammed S, Anwer ZM. Consequences of Anabolic Androgenic Steroids Abuse in Males, Sexual Hepatic and Metabolic Perspective. Iraqi J Pharm Sci 2023;32(3):25–34.
11. Dheyaa Jabbar Kadhim, Ammar Fadhil Shanan. Practices and Perception of Community Pharmacists Towards Antimicrobial Stewardship in Iraq. Iraqi J Pharm Sci 2025;34(2):21–8.
12. Al Shawi AF, Ali AF, Enad MM, et al. Self-medication among medical students in Anbar and Fallujah Universities – Iraq. J Fac Med Baghdad 2018;60(3):156–9.
13. United Nations Office on Drugs and Crime. Conducting School Surveys on Drug Abuse. United Nations Publications; 2005.[cited 2025 Dec 14].
14. Ammar Faisal Hameed. Topical Steroid Misuse on the Face: A Medical and Social Problem in Iraq. IPMJ 2014;13(3):413–7.
15. Abdulzahra MA. Substance dependence in Diwania province. Kufa Med Journal 2010;13(2):118–28.
16. Helal RM, Abou-ElWafa HS. Self-Medication in University Students from the City of Mansoura, Egypt. J Environ Public Health 2017;2017:9145193.
17. Tadesse YB, Kassaw AT, Belachew EA. Evaluating self-medication practices in Ethiopia. J Pharm Policy Pract 2023;16(1):47.
18. Shehnaz SI, Agarwal AK, Khan N. A Systematic Review of Self-Medication Practices Among Adolescents. Journal of Ado Health 2014;55(4):467–83.

19. Araia ZZ, Gebregziabher NK, Mesfun AB. Self medication practice and associated factors among students of Asmara College of Health Sciences, Eritrea: a cross sectional study. J Pharm Policy Pract 2019;12(1):3.
20. Albatti TH, Alawwad S, Aldueb R, et al. The self medication use among adolescents aged between 13-18 years old; Prevalence and behavior, Riyadh - Kingdom of Saudi Arabia, from 2014-2015. Int J Pediatr Adolesc Med 2017;4(1):19–25.
21. Shah K, Halder S, Haider SS. Assessment of knowledge, perception, and awareness about self-medication practices among university students in Nepal. Heliyon 2021;7(1):e05976.
22. Alkhatib B, Agraib L, Hasan H, et al. The Use of Herbs, Dietary Products, and Different Types of Diet for Weight Loss Purposes. Iran J Public Health 2023;52(7):1390-8.
23. Gottfredson NC, Hussong AM. Parental involvement protects against self-medication behaviors during the high school transition. Addictive Behaviors 2011;36(12):1246–52.
24. ALmughais ES, Alreshidi FF, Ahmed H. Prevalence of antibiotic misuse in cases of pneumonia and diarrhea in Saudi Arabia. Drug Target Insights 2023;17:114–9.
25. Micah D, Yunusa U. Determinants of self-medication among undergraduate students of Bayero University Kano. TJHS 2025;31(4):16–23.
26. Malli IA, Hubayni RA, Marie AM, et al. The prevalence of self-medication and its associated factors among college students: Cross-sectional study from Saudi Arabia. Prev Med Rep 2023;36:102457.
27. Albatti TH, Alawwad S, Aldueb R, et al. The self medication use among adolescents aged between 13–18 years old; Prevalence and behavior, Riyadh – Kingdom of Saudi Arabia, from 2014–2015. Int J Pediatr Adolesc Med 2017;4(1):19–25.
28. Alsofyani MAA, Al-Essa MHA, Assiri MA. Prevalence of People That Using Multivitamins Supplementation and Experiencing a Side Effect in Saudi Arabia. Egypt J Hosp Med 2018;70(1):65–71.
29. Aljehani F, Qashqari MB, Alghamdi MK, et al. Prevalence of Iatrogenic Vitamin D Toxicity Among the Saudi Population of Vitamin D Users Due to Overcorrection. Cureus 2023;15(4):e37521.
30. Wagner DN, Marcon AR, Caulfield T. “Immune Boosting” in the time of COVID: selling immunity on Instagram. Allergy, Asthma & Clinical Immunology 2020;16(1):76.
31. Radhwan N. Al-Zidan, Ahmed S. Saadallah, Ghayth M Abdulrazzaq. The public health dilemma of Self-Medication with Antibiotics: The undergraduate students of the College of Pharmacy in Mosul as an example. IJPSR 2020;11(3):3743–51.
32. Khulood Saadoon Salim, Atheer S. Alsabah, Hassanian S. Taghi. Misuse of antibiotics in Iraq: A review of Iraqi published studies. AJPS 2022;21(2):15–20.
33. Yawuz MJ, Mohammed SI, Alshamari IO, et al. Dispensing of Antimicrobial Agents Without a Prescription in Iraq: A Call for Upholding the Legislations to Change Long-Standing Practices. Al-Rafidain J Med Sci 2024;6(1):208–14.
34. Basma Zuheir Al-Metwali, Hasan A. Shubbar. Assessing Antimicrobial Prescribing Patterns and Antimicrobial Resistance in Dhi Qar Governorate Hospitals; A retrospective study. Iraqi J Pharm Sci 2025;34(2):215–26.
35. Alfetlawi B, Jasim A. Determining the Prevalence of Upper and Lower Urinary Tract Infections’ Pathogens and Their Antibiotic Susceptibility Profile for Adult Patients in Al-Diwaniya, Iraq (Conference Paper) #. Iraqi J Pharm Sci 2023;31:86–91.
36. Negarandeh R, Shayan SJ, Nazari R, et al. Self-medication with antibiotics in WHO Eastern Mediterranean Region: A Systematic Review and Meta-analysis 2020,p.1-19.
37. Nusair MB, Al-Azzam S, Alhamad H, et al. The prevalence and patterns of self-medication with antibiotics in Jordan: A community-based study. Int J Clin Pract 2021;75(1):e13665.
38. T. Allam A, MAS. Prevalence and factors influencing self-medication in Medina Al-Munawara, Saudi Arabia. Arch Pharma Pract 2020;11(4):43–54.
39. Dinu M, Lotti S, Mattioli AV, et al. Effects of Omega-3 Fatty Acid Supplementation on Revascularization and Major Cardiovascular Events: A Systematic Review and Meta-Analysis. The 14th European Nutrition Conference FENS 2023, Basel Switzerland: MDPI; 2024, p. 199.
40. Ayubi N, Wibawa JC, Aljunaid M, et al. Omega-3 Supplementation is Effective in Reducing Interleukin-6 Levels After Physical Exercise: A Systematic Review. KCMJ 2025;21(2):107–16.
41. Sherzai D, Moness R, Sherzai S, et al. A Systematic Review of Omega-3 Fatty Acid Consumption and Cognitive Outcomes in Neurodevelopment. Am J Lifestyle Med 2023;17(5):649–85.
42. Cornu C, Mercier C, Ginhoux T, et al. A double-blind placebo-controlled randomised trial of omega-3 supplementation in children with moderate ADHD symptoms. Eur Child Adolesc Psychiatry 2018;27(3):377–84.
43. Chang JP-C, Tseng P-T, Zeng B-S, et al. Safety of Supplementation of Omega-3 Polyunsaturated Fatty Acids: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Adv Nutr 2023;14(6):1326–36.
44. Jebur RS, ALkhafaji DrAH mohammed A, Taresh OJ, et al. Prevalence of Vitamin D Deficiency among Iraqi People. South East Eur J Public Health 2024:245–51.
45. Manson JE, Cook NR, Lee I-M, et al. Vitamin D Supplements and Prevention of Cancer and Cardiovascular Disease. N Engl J Med 2019;380(1):33–44.
46. Thanapluetiwong S, Chewcharat A, Takkavatakarn K, et al. Vitamin D supplement on prevention of fall and fracture: A Meta-analysis of Randomized Controlled Trials. Medicine 2020;99(34):e21506.
47. Giustina A, Bilezikian JP, Adler RA, et al. Consensus Statement on Vitamin D Status Assessment and Supplementation: Whys, Whens, and Hows. Endocr Rev 2024;45(5):625–54.
48. Supriya CK, Prakash C, Nandini T, et al. A comparative study on the knowledge, attitudes, and practices of self-medication in rural and urban regions of Tumkur, Karnataka, India. MGM Journal of Medical Sciences 2025;12(2):240–8.