Research Article

Self-medication and associated factors: A cross-sectional study among undergraduate students at the University of Juba, South Sudan

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ABSTRACT

Introduction: Self-medication (SM), the use of unauthorized medicines for self-diagnosed disorders or symptoms, is a global problem in healthcare delivery. Although SM can provide quick relief for minor ailments, it also poses significant risks, including misdiagnosis, adverse reactions, and antimicrobial resistance. There is currently scant evidence on SM in South Sudan. Therefore, this study aimed to assess its prevalence, use, and associated factors among undergraduate students at the University of Juba.

Method: A cross-sectional descriptive study was conducted at the University of Juba. A three-stage sampling technique was used to select 384 students. Data were collected through a researcher-administered structured questionnaire. Using IBM SPSS 23.0, descriptive statistics were obtained, and chi-squared tests and multivariate logistic regression analysis were performed to identify significantly associated factors.

Results: Of 324 respondents, the modal age group was 23-27 years (206 participants); males were the dominant group (63%). 275 were single, and 299 (78%) were Christians. The prevalence of SM in the last six months was 75.6%. Analgesics, antibiotics, and antimalarial medications were the most used therapeutic groups. Logistic regression analysis showed quality of sleep (aOR 0.22, 95% CI 0.08-0.64, p-value 0.005) and source of medication information (aOR 0.15, 95% CI 0.05-0.50, p-value 0.002) as significantly associated predictors in this study.

Conclusion: Self-medication is highly prevalent among undergraduate students at the University of Juba. It is associated with peer influence, sleep quality, and the source of medication information. The study recommends strengthening regulations on rational medication use and increasing awareness among the students at the university.

Keywords: self-medication, students, University of Juba, South Sudan

Introduction

Self-medication (SM) is 'the use of medicines to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of prescribed drugs for chronic or recurrent diseases or symptoms'.[1] Patients make the decision when they believe the severity of their symptoms warrants drug therapy, but not to the extent of justifying a physician's consultation.[2] According to the World Health Organization (WHO), SM serves a purpose, such as the convenience of obtaining appropriate medications for conditions that do not require consultation, but such medications should be prescribed by law only if proven to be fit for the purpose.[1] The problem is therefore inappropriate use of prescription-only medicines, which seems to be widespread.

Globally, several studies report varying levels of SM. For instance, in a Jordanian study, prevalence was as high as 98.4% while it was 92.4% in Iraq, 87.1% in Yemen, 81.3 in Serbia, 78% in Sri Lanka, 66.4%, and 54.3% in Portugal.[2–7] In these settings, SM is influenced by age, educational level, and family attitudes, advertising of drugs by manufacturers, lack of legislation regulating dispensing and sale of drugs, previous experiences with the symptoms or disease, and significance attributed to the disease.

In the African Continent, a systematic review involving 19 countries reported SM prevalence ranging from 12.1% to 93.9%.[8] There is marked heterogeneity across African countries and settings, as the practice is reportedly highest (96.9%) among medical students at Sudan International University, with lower findings in other countries, including 69.4% in Nigeria, 62.9% among university students in Egypt, 61.1% among medical students at the Copperbelt University in Zambia.[9–11] From these studies, SM is attributed to shortages of drugs at health facilities, long waiting time, long distance from health facilities, inability to pay for health care charges and the freedom to choose the preferred drugs, lack of medical professionals, poor quality of healthcare facilities, unregulated distribution of medicines and patients' misconception about physicians, mildness of disease, familiarity with the drug and illness.

The WHO guidelines for the regulatory assessment of medicinal products for use in SM associate SM with many problems, ranging from incorrect self-diagnosis to excessively prolonged use, risk of dependence and abuse, as well as storage of medicines in incorrect conditions or beyond the recommended shelf life.[1] This makes the practice a major public health problem. Despite several studies conducted in other settings, there is inadequate evidence on SM in South Sudan, and none has been conducted among university students. Therefore, this study aimed to assess the prevalence, commonly used medicines, and associated risk factors of SM among undergraduate students at the University of Juba.

Method

The study was conducted at the University of Juba, South Sudan's premier university, located in Juba, the country's administrative and economic hub. Since 1975, the university has grown and currently hosts 40,000 students across 22 Schools, 3 Institutes, and 4 specialized centres, of which 4,000 are postgraduate students. This study targeted the undergraduate students, estimated at more than 36,000.[12]

A cross-sectional design was adopted. Primary quantitative data were collected from a convenience sample of students using a pretested structured questionnaire. Cochran's formula was used to estimate the sample size; it assumed a confidence level of 95% and a prevalence of 50%, resulting in a sample of 384. The sampling procedure was as follows: First, the university's natural clusters, i.e., colleges/institutes/centres, were identified. Second, the clusters were randomly selected by assigning each college a unique identifier (e.g., College 1, College 2, etc.), and students were selected via a lottery. Next, all selected students in the selected clusters were interviewed based on their presence and willingness to participate. Three teams, each consisting of two data collectors, were dispatched to the selected clusters. To participate in this study, one had to be a University of Juba student aged 18 years and above, and willing to participate.

Prevalence of SM in the last six months was the variable of interest and the dependent variable in the regression analysis. Variables recorded that could potentially affect SM included demographic factors (Age, Sex, Marital status, Residence, Religion and Year of study), social factors (peer influence, family influence, cultural beliefs, stress and social supports), economic factors (income status, employment and willingness to pay), educational factors (academic pressure, exam anxiety and workload coping mechanisms e.g. use of stimulants or relaxants), previous healthcare experiences (satisfaction with previous medical service, past adverse drug reactions and trust in medical practitioners), health system factors (distance to nearest health facility, health insurance status, cost of medical consultation, frequency of common illness and chronic disease) and medication specific factors (types of

medication and frequency and dosage of medication).

Epidata Manager 4.6.0.6 and IBM SPSS 23.0 were used for quality-assured data entry and analysis, respectively. Descriptive statistics, chi-squared tests, and regression analyses were performed. At a 95% confidence limit, p-values less than or equal to 0.05 were considered significant.

Mindful of quality assurance, we followed the approved protocol, trained enumerators in ethical data collection, and pretested the questionnaire with 10 students who did not participate in the final sample. In addition, quality checks were carried out daily, and corrective actions were taken before the next session. Ethically, this study was expected to cause minimal or no harm

Table 1. Relation of general characteristics of the respondents to self-medication

Variables		Did you self-medicate within the last six months?		Total n (%)	p-value
		Yes n (%)	No n (%)		
Age group in years	18-22	46 (74.2)	16(25.8)	62 (19.1)	0.860
	23-27	155 (75.2)	51 (24.8)	206 (63.6)	
	28-32	40 (76.9)	12 (23.1)	52 (16.0)	
	33-42	4 (100.0)	0 (0)	4 (1.2)	
Sex	Male	147 (72.1)	57 (27.9)	204 (63.0)	0.052
	Female	98 (81.7)	22 (18.3)	120 (37.0)	
Marital Status	Single	210 (76.4)	65 (23.6)	275 (84.9)	0.093
	Married	34 (75.6)	11 (24.4)	45 (13.9)	
	Divorced/separated	1 (25.0)	3 (75.0)	4 (1.2)	
Religion	Christian	226 (75.6)	73 (24.4)	299 (92.3)	0.777
	Muslim	15 (78.9)	4 (21.1)	19 (5.9)	
	African traditional believer	3 (60.0)	2 (40.0)	5 (1.5)	
	Others	1 (100.0)	0 (0)	1 (0.3)	
School	Computing and Information Technology	23 (85.2)	4 (14.8)	27 (8.3)	0.606
	Engineering and Architecture	29 (70.7)	12 (29.3)	41 (12.7)	
	Medicine	49 (80.3)	12 (19.7)	61 (18.8)	
	Petroleum and Mining	4 (57.1)	3 (42.9)	7 (2.2)	
	Applied and Industrial Science	24 (82.8)	5 (17.2)	29 (9.0)	
	Business and Management	21 (70.0)	9 (30.0)	30 (9.3)	
	Medical Laboratory	26 (78.8)	7 (21.2)	33 (10.2)	
	Natural Resources & Environmental Studies	30 (68.2)	14 (31.8)	44 (13.6)	
	Veterinary Medicine	25 (78.1)	7 (21.9)	32 (9.9)	
	Law	14 (70.0)	6 (30.0)	20 (6.2)	
Presence of long-term condition	Yes	14 (82.4)	3 (17.6)	17 (5.2)	0.772
	No	231 (75.2)	76 (24.8)	307 (94.8)	
Total		**245 (75.6)**	**79 (24.4)**	**324 (100)**	

Table 2. Relation of health status-related factors to self-medication

Variables		Did you self-medicate within the last six months?		Total n (%)	p-value
		Yes n (%)	No n (%)		
Smoking status	Yes	8 (80.0)	2 (20.0)	10 (3.1)	0.743
	No	237 (75.5)	77 (24.5)	314 (96.9)	
Alcohol consumption status	Yes	18 (85.7)	3 (14.3)	21 (6.5)	0.265
	No	227 (74.9)	76 (25.1)	303 (93.5)	
Type of medication most frequently used for self-medication	Analgesics	130 (75.1)	43 (24.9)	173 (53.4)	0.037*
	Antibiotics	35 (79.5)	9 (20.5)	44 (13.6)	
	Cold/Influenza medications	15 (62.5)	9 (37.5)	24 (7.4)	
	Herbal or traditional medicines	8 (66.7)	4 (33.3)	12 (3.7)	
	Cough syrups	9 (90.0)	1 (10.0)	10 (3.1)	
	Anti-malarial	44 (86.3)	7 (13.7)	51 (15.7)	
	Anti-diarrhoeal medications	2 (33.3)	4 (66.7)	6 (1.9)	
	Others	2 (50.0)	2 (50.0)	4 (1.2)	
Peer influence	No	79 (66.9)	39 (33.1)	118 (36.4)	0.006*
	Yes	166 (80.6)	40 (19.4)	206 (63.6)	
Influence of cultural beliefs decision making	Yes	64 (75.3)	21 (24.7)	85 (26.2)	0.936
	No	181 (75.7)	58 (24.3)	239 (73.8)	
Source of information on medications	Pharmacy	138 (78.9)	37 (21.1)	175 (54)	0.005*
	University health talks	26 (68.4)	12 (31.6)	38 (11.7)	
	Medical leaflets	59 (80.8)	14 (19.2)	73 (22.5)	
	Friends	15 (75.0)	5 (25.0)	20 (6.2)	
	Class	7 (38.9)	11 (61.1)	18 (5.6)	
Reasons for choosing self-medication	It's cheaper than seeing a doctor	106 (78.5)	29 (21.5)	135 (41.7)	
	It saves time	46 (75.4)	15 (24.6)	61 (18.8)	0.649
	I don’t feel my symptoms are serious enough for a doctor	41 (73.2)	15 (26.8)	56 (17.3)	
	It's more convenient	14 (77.8)	4 (22.2)	18 (5.6)	
	I can't afford medical consultation	20 (71.4)	8 (28.6)	28 (8.6)	
	I prefer managing my health myself	12 (80.0)	3 (20.0)	15 (4.6)	
	Academic pressure	4 (66.7)	2 (33.3)	6 (1.9)	
	Examination anxiety	2 (40.0)	3 (60.0)	5 (1.5)	
Self-rating of the quality of sleep	Poor	49 (90.7)	5 (9.3)	54 (16.7)	0.005*
	Good	196 (72.6)	74 (27.4)	270 (83.3)	
Use of stimulants or relaxants for stress relief	Yes	38 (73.1)	14 (26.9)	52 (16.0)	0.641
	No	207 (76.1)	65 (23.9)	272 (84.0)	
Total		**245 (75.6)**	**79 (24.4)**	**324 (100)**	

to the respondents since it did not involve any invasive procedures. Nevertheless, all ethical principles of autonomy, beneficence, non-maleficence, and justice were followed diligently. Institutional ethical clearance was obtained from the School of Medicine, University of Juba (Ref. SM/17/24), then from the University of Juba Administration, and informed consent was obtained from each participant prior to data collection.

Results

Table 1 shows the relation of general characteristics of the respondents and self-medication. Of the 384 initial sample, only 84.4% (324) responded. Out of this, the modal age group (63.6%) was 23-27 years, with males being dominant (63%), and 84.9% were single. The majority (92.3%) were Christians, and only 5.2% (17) reported having a long-term illness. Around 76% (210) of single students said they practised SM, while Computing and Applied and Industrial Science have the highest proportion.

Analgesics (53.4%) were the main medications used for SM, followed by antimalarial medicines, with the least used being cough syrups (3.1%). Most respondents (63.6%) admitted peer influence on their decision about SM (Table 2).

Table 3. Relation of other health status factors of the respondents to self-medication

Variables		Did you self-medicate within the last six months?		Total n (%)	p-value
		Yes n (%)	No n (%)		
Satisfaction with previous medical services	Yes	189 (76.2)	59 (23.8)	248 (76.5)	0.654
	No	56 (73.7)	20 (26.3)	76 (23.5)	
Experience of adverse reactions to medications	Yes	46 (78.0)	13 (22.0)	59 (18.2)	0.561
	No	199 (75.1)	66 (24.9)	265 (81.8)	
Extent of trust in medical practitioners	Very much	84 (75.7)	27 (24.3)	111 (34.3)	
	Somehow	103 (76.9)	31 (23.1)	134 (41.4)	0.893
	I don't	12 (80.0)	3 (20.0)	15 (4.6)	
	Little	36 (73.5)	13 (26.5)	49 (15.1)	
	Very little	10 (66.7)	5 (33.3)	15 (4.6)	
Distance from the nearest health facility to you	Very close	91 (72.2)	35 (27.8)	126 (38.9)	0.517
	A little far	121 (78.1)	34 (21.9)	155 (47.8)	
	Very far	33 (76.7)	10 (23.3)	43 (13.3)	
Health insurance status	Yes	34 (82.9)	7 (17.1)	41 (12.7)	0.243
	No	211 (74.6)	72 (25.4)	283 (87.3)	
Do you find the university health services easy to access?	Yes	119 (74.8)	40 (25.2)	159 (49.1)	0.750
	No	126 (76.4)	39 (23.6)	165 (50.9)	
Have you experienced any common illnesses recently?	Yes	189 (75.9)	60 (24.1)	249 (76.9)	0.827
	No	56 (74.7)	19 (25.3)	75 (23.1)	
Likelihood of seeking professional care when falling sick	Yes	127 (76.0)	40 (24.0)	167 (51.5)	0.730
	No	8 (88.9)	1 (11.1)	9 (2.8)	
	Sometimes	110 (74.3)	38 (25.7)	148 (45.7)	
Total		**245 (75.6)**	**79 (24.4)**	**324 (100)**	

Table 4. Logistic Regression Analysis: Predictors of Self-medication

Variables	cOR (95% CI)	p-value	aOR (95% CI)	p-value
Peer Influence				
No	Ref.			
Yes	2.05 (1.22,3.43)	0.006	1.75 (0.98,3.12)	0.061
Quality of Sleep				
Poor	Ref.			
Good	0.27 (0.10,0.71)	0.007	0.22 (0.08,0.64)	0.005
Source of information on medications				
Pharmacy	Ref.			
University health talks	0.58 (0.27,1.26)	0.169	0.56 (0.24,1.34)	0.195
Medical leaflets	1.13 (0.57,2.25)	0.727	1.45 (0.66,3.19)	0.350
Friends	0.80 (0.27,2.36)	0.691	0.75 (0.23,2.45)	0.635
Class	0.17 (0.06,0.47)	0.001	0.15 (0.05,0.50)	0.002
Type of medications most frequently used for SM				
Painkillers	Ref.			
Antibiotics	1.29 (0.57,2.89)	0.542	1.22 (0.50,2.96)	0.663
Cold/Influenza medication	0.55 (0.23,1.35)	0.192	0.46 (0.17,1.24)	0.123
Cough syrups	2.98 (0.37,24.18)	0.307	1.35 (0.16,11.48)	0.781
Herbal or traditional medicines	0.66 (0.19,2.31)	0.517	0.62 (0.14,2.67)	0.522
Anti-malarial	2.08 (0.87,4.96)	0.099	1.76 (0.69,4.52)	0.240
Anti-diarrhoea	0.17 (0.03,0.94)	0.042	0.15 (0.02,1.14)	0.067
Others	0.33 (0.05,2.42)	0.276	0.62 (0.06,6.25)	0.682

Out of 248 respondents reporting satisfaction with previous medical services, 76.2% self-medicated in the last six months preceding the study. Similarly, 75.1% of those who did not experience adverse reactions practised SM (Table 3).

Overall, 75.6% (245) of respondents reported SM, with more than 80% of females reporting SM. Of SM users, 94.3% (231) did not have long term conditions, 96.7% (237) were non-smokers, and 92.7% (227) did not drink alcohol (Tables 1 and 2).

Factors that were significant at bivariate analysis (peer influence, sources of medication information, type of medication and self-rating of the quality of sleep) were subjected to logistic regression analysis (Table 4). Students who had good quality of sleep were significantly less likely to SM (aOR 0.22, 95% CI 0.08-0.64, p-value 0.005), as were those who got information from members of their class, rather than from a pharmacy (aOR 0.15, 95% CI 0.05-0.50, p-value 0.002). There were no other significant associations.

Discussion

This study assessed the level and associated factors of SM among the University of Juba undergraduate students, as well as the commonly used medicines. Seventy-five percent of respondents admitted engaging in SM, and this was associated with the source of information and the quality of sleep. These findings are lower than the prevalence reported by studies conducted in Sri Lanka (78%), Iraq (92.4%), Jordan (98.4%), Serbia (81.3%), and Sudan, where SM was practiced by almost the entire sample (96.9%).[2,3,5,7,9] They are, however, higher compared to

findings from studies conducted in African countries such as Nigeria (69.4%) and Egypt (62.9%).[10] Given the estimated Global and sub-Saharan Africa antibiotic SM of 43% and 55.2%, respectively, our findings warrant particular attention, as antibiotics are among the most affected medicines in this study.[13] In consonance with our findings, studies conducted in Ethiopia and Jordan reported analgesics at the top of the list along with antibiotics, while in India, allopathic remedies featured, a manifestation of regional preferences of medication use.[2,14,15]

Our study found a significant association between SM and the source of medication information and sleep quality, but no relationship with factors such as academic pressure, financial constraints, ease of access to medications, prior experience with similar illnesses, and family influence. These findings are not consistent with those from Zambia, which identified economic and social factors as key determinants of SM.[11] A similar study among students in Uganda reported the reasons for SM as minor illness, time-saving, old prescriptions, and high consultation fees.[16] There is a need to further investigate the specific role of peers and the effects of the high levels of SM at the university.

Conclusion

Self-medication is widely practiced among undergraduate students at the University of Juba and involves the free use of analgesics, antibiotics, cold/influenza medications, herbal or traditional medicines, and cough syrups. The practice is significantly associated with peer influence, source of medication information, and sleep quality. The study recommends enforcing standard treatment guidelines and accurately implementing drug use plans to mitigate SM practices. An awareness intervention is also recommended at the University to address peer influence and sleep quality.

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