

Self-medication practices and their relationship with the psychological wellbeing in university employees of Saudi Arabia: a cross-sectional study

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ABSTRACT

Objective: To determine the prevalence of depression, anxiety, and stress (DAS) and their association with self-medication (SM) practices among university employees in Saudi Arabia, along with the key sociodemographic determinants.

Methods: This cross-sectional study was conducted using a self-administered online survey from July 2022 to June 2023. A total of 383 university employees from Riyadh, Saudi Arabia, were included through non-probability sampling. Data were collected on sociodemographic variables, self-medication behavior, and psychological distress using validated DAS Scale (DASS-21). SM practices were analyzed in relation to DAS scores using descriptive statistics, Chi-square tests, t-tests, and univariate logistic regression.

Results: Among 383 participants, 71% were male. Prevalence of self-medication (SM) was 60.8%. Overall, 25.1% of participants exhibited symptoms of depression, 39% had anxiety, and 21.9% reported stress. Among individuals who were engaged in SM, the prevalence of depression was 16.2% (n=62), anxiety 27.7% (n=106), and stress 15.1% (n=58). Anxiety showed a significant association with SM (p=0.002), while depression (p=0.669) and stress (p=0.087) did not. Mean anxiety (8.34 vs. 5.79; p=0.002) and stress scores (9.28 vs. 6.97; p=0.013) were significantly higher in SM users. Univariate regression revealed that moderate anxiety was strongly associated with SM (OR=3.6; 95% CI: 1.77–7.29; p=0.003). No significant associations were observed for depression or stress.

Conclusion: Self-medication is common among university employees in Saudi Arabia and is significantly associated with anxiety, particularly at moderate levels. These findings emphasize the need for awareness programs addressing mental health and the risks associated with unsupervised medication use, particularly in academic settings.

Keywords: Self Medication (MeSH); Occupational Groups (MeSH); University employees (Non-MeSH); Universities (MeSH); Occupational Groups (MeSH); Mental Health (MeSH); Depression (MeSH); Anxiety (MeSH); Stress (MeSH); Saudi Arabia (MeSH).

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INTRODUCTION

The unsupervised intake of medication without professional consultation, commonly referred to as self-medication (SM), is increasingly prevalent worldwide and is driven by a range of socio-economic and behavioral factors. The World Health Organization (WHO) defines self-medication as 'the use of OTC (over-the-counter medication) for the intervention of disorders with self-

diagnosed symptoms'.¹ SM practices may include the reuse of previous prescriptions for similar symptoms, the use of OTC drugs without clinical advice, or reliance on recommendations from family or non-professional sources.

The prevalence of SM varies widely across low- and middle-income countries, with reported rates ranging from 12.7% to 95%.² Contributing factors include limited access to

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healthcare, prolonged waiting times for medical consultations, and the easy availability of medications.³ Despite being perceived as convenient, SM is associated with numerous clinical and public health risks. These include increased antimicrobial resistance, adverse drug reactions, worsening of underlying medical conditions, and negative psychosocial consequences such as impaired judgment, legal complications, and mental health disorders.

A growing body of epidemiological and clinical evidence suggests a strong link between mental health conditions, particularly depression, anxiety, & stress, and maladaptive behaviors such as substance use and self-medication. For instance, over half of individuals with substance use disorders have been found to have co-occurring mental disorders.⁴ Globally, the prevalence of depression, anxiety, and stress is estimated to be 28%, 26.9%, and 24.1%, respectively.⁵ Working professionals are particularly vulnerable to these mental health challenges due to job-related pressures and financial insecurities.⁶ Although academic professionals are generally well-informed about the risks of SM, the psychological burden of occupational stress may still predispose them to engage in such practices.⁷ This group is often perceived to possess adequate knowledge of pharmacological safety; however, high occupational stress, mental health challenges, and easy access to medications may still predispose them to inappropriate self-medication behaviors. Given the limited

data on the psychological correlates of SM within academic institutions in Saudi Arabia, there is a pressing need to explore this relationship to inform targeted mental health and pharmaceutical education interventions.

In the light of these considerations, the present study was planned to determine the prevalence of depression, anxiety, and stress associated with self-medication practices among academic employees in Saudi Arabia. Additionally, the study utilizes Depression, Anxiety, and Stress Scale (DASS-21) to assess the severity and correlation of these psychological factors with self-medication behavior.

METHODS

A self-administered online survey was used to compile the data. We employed a non-probability sampling technique in this cross-sectional study and collected data from July 2022 to June 2023. Over 1 year, 383 university employees filled out the questionnaire. Employees of the capital of Saudi Arabia (Riyadh) universities were included, whereas people under eighteen, unemployed, non-university employees, and illiterate individuals were excluded from the study. All the participants were guided on how to fill out the questionnaire. Patients' stress, depression, and anxiety were measured through DASS (Depression, Anxiety and Stress Scale).⁸ The participants were analyzed against three sections: sociodemographic features, practices on the use of medicines, and prevalence of DAS (Depression, Anxiety, and Stress) in the cohort. Sample characteristics were examined by age, sex, marital status, number of children, education level, and monthly income. Practices on the use of medicines were assessed by asking if they had any misuse event (unadvised intake of medicines) happened in their life and the frequency of misuse events (MUE). The DASS questionnaire was also included in determining if any correlation exists between DAS and the behavior of SM. DASS questionnaire exhibits comparable efficacy with other scales and is attributed to psychometric properties. Past literature has corroborated the authenticity and reliability of the estimation of

psychiatric behaviors of DAS. With reference to it, 21 items were established exhibiting three subscales (Depression, Stress, and Anxiety); each entailed seven questions. For each question, scoring was performed from the 0-3 range, whereby 0 refers to the lowest value and 3 displays the severity of the ailment, the summation of subscale values, and subsequent multiplication by two performed final scoring. Results may vary from 0 to >34. Score count guided the establishment of four levels: normal, mild, moderate, and severe.

The ethical approval for this study was obtained from the Institutional Review Board of King Saud University (IRB No: E-21-6439), Riyadh, Saudi Arabia. All participants signed an informed consent form outlining the study's goals, relevance, and confidentiality provisions prior to any data collection. All information provided by participants was kept private and anonymous. In addition, participants were enabled to decline participation or withdraw at any moment. Participants were not guaranteed any financial or other benefits. Data were statistically analyzed using SPSS version 21, and

descriptive statistics were employed to determine the characteristics of the dataset. Frequency distribution rendered cumulative percentages to delineate the prevalence of the SM practice. We also employed univariate logistic regression models to appraise the relationship between the dependent variable (SM practices) and the independent variables (Depression, Anxiety, Stress). Data estimation and Odds ratios were performed at a 95% Confidence Interval (CI), and $p < 0.05$ was considered significant using A Pearson's Chi-square and an independent t-test. The data output was finally presented in the form of tables and charts.

RESULTS

Table I reveals that among university employees, 383 participated, with 35.5% (136) less than 30 years of age and 47% (98) are 41 years old and more, 71% (272) male and female 29% (111), and 60.1% (230) are married ($p=0.036$). More than 25% (102) have master's and PhD degrees, while 47.2 % (181) have a monthly income of 10000 SAR and more. Of those who participated in the study, 55.1% (211)

Table I: Sociodemographic characteristics of participated subjects (n=383)

Variable	Subcategory	Frequency (%)	P value
Age (year)	Less than 30	35.5 (136)	0.067
	31-40	17.5 (149)	
	41 and more	47 (98)	
Gender	Male	71 (272)	0.84
	Female	29 (111)	
Marital Status	Married	60.1 (230)	0.036*
	Unmarried	39.9 (153)	
Number of children	None	44.9 (172)	0.003*
	1 child and more	55.1 (211)	
Education level	Below Bachelor	19.8 (76)	0.638
	Bachelor	53.5 (205)	
	Master's & PhD	26.7 (102)	
Monthly Income (SAR)	Less than 10000	52.7 (202)	0.923
	10000 and more	47.2 (181)	

*Significant, SAR: Saudi Arabian Riyal

Table II: Prevalence of depression, anxiety, stress and its severity in university employees and comparison of self-medication users and non-users (n=383)

Depression, Anxiety, Stress Scale	Total sample size (n=383)	Self-medication user (n=233)	Non-user (n=150)	p value
Total Depression prevalence [n (%)]	96 (25.1%)	62 (16.2%)	34 (8.8%)	0.669
Normal	287 (74.9)	171 (44.6)	116 (30.3)	
Mild	32 (7.8)	21 (5.5)	9 (2.3)	
Moderate	92 (9.7)	24 (6.3)	13 (3.4)	
Total Anxiety prevalence [n (%)]	149 (39%)	106 (27.7%)	43 (11.3%)	
Normal	234 (61.1)	127 (33.2)	107 (27.9)	0.002*
Mild	24 (6.3)	16 (4.2)	8 (2.1)	
Moderate	58 (15.2)	47 (12.3)	11 (2.9)	
Severe	67 (17.5)	43 (11.2)	24 (6.3)	
Total Stress prevalence [n (%)]	84 (21.9%)	58 (15.1%)	26 (6.8%)	0.087
Normal	299 (78.1)	175 (45.7)	124 (32.4)	
Mild	29 (7.6)	24 (6.3)	5 (1.3)	
Moderate	36 (9.4)	22 (5.7)	14 (3.7)	
Severe	19 (4.9)	12 (3.1)	7 (1.8)	

*Significant

Table III: Univariate logistic regression analysis of the association of depression, anxiety, and stress with self-medication practice (n=383)

Variable	Subcategory	Number of subjects	Univariate		
			Odds ratio (OR)	95% CI	p value
Depression	Normal	287	Ref.		0.672
	Mild	32	1.583	0.700-3.578	
	Moderate	92	1.252	0.613-2.560	
	Severe	42	0.961	0.442-2.087	
Anxiety	Normal	234	Ref.		0.003*
	Mild	24	1.685	0.694-4.090	
	Moderate	58	3.600	1.779-7.286	
	Severe	67	1.510	0.861-2.647	
Stress	Normal	299	Ref.		0.114
	Mild	29	3.401	1.263-9.159	
	Moderate	36	1.113	0.548-2.261	
	Severe	19	1.215	0.465-3.173	

*Significant

have one or more children with a p value of 0.003. Among the participants, 233 practiced SM while 150 did not practice SM.

Table II shows the association between DASS and those who practiced SM. Among those who practiced SM, the prevalence of depression was 16.2% (n=62, p=0.669), anxiety 27.7% (n=106, p=0.002), and stress 15.1% (n=58, p=0.087). It also shows that 12.3% (n=47) and 11.2% (n=43) are moderately and severely anxious, respectively.

Figure 1 reveals the total mean depression score of those who practiced SM, 6.51 ± 0.531 , and for those who did not was 5.68 ± 0.715 with $P=0.346$. The total anxiety score for those who practiced SM is 8.34 ± 0.542 and for those who did not is 5.79 ± 0.637 , with $P=0.002$, and the total stress score is 9.28 ± 0.569 and 6.97 ± 0.729 with $P=0.013$ for those who practiced and for those who did not, respectively.

Our results, as presented in Table III, depict the univariate regression model of the DASS. In the univariate model, mild, moderate, and severe anxiety reveal significant association with SM (p value = 0.003), respectively. SM was 1.6 times as likely if the participant had mild anxiety, 3.6 times if the participant had moderate anxiety, and 1.5 times if the participant had severe anxiety. On the other hand, depression and stress do not show significant correlation with SM practices (p=0.672 and p=0.114, respectively).

DISCUSSION

Our study found a significant association between self-medication and anxiety among university employees, with higher anxiety levels observed in self-medication users. Although depression and stress were more common in this group, the differences were not statistically significant. These findings highlight the need to address mental health concerns and discourage self-medication as a coping mechanism in academic settings.

The phenomenon of SM is prevalent globally, both in developed and developing countries. In Saudi Arabia, several studies have reported a wide

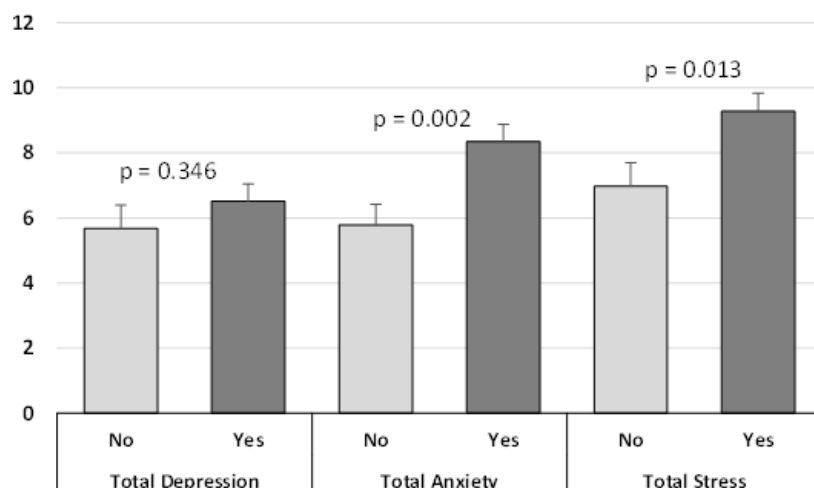


Figure 1: Comparison of mean scores of depression, anxiety, and stress among university employees with self-medication users and non-users.

range of prevalence of SM among university students (19.61% to 98.7%).⁹ A cross-sectional study conducted in the UAE in 2021 revealed that 57.5% of university students practiced SM. The percentage of consulting a pharmacist was found to be lower among medical students compared to non-medical students.¹⁰

In coherence, a study in 2018 marked a 99% prevalence of SM among the Pakistani medical students.¹¹ On the other hand, a prevalence of 25.1 % was reported in a study conducted in Kabul medical students. Several factors might lead to this low prevalence, including beliefs in traditional medicine, low income, availability of medication, and others.¹²

Several studies have mentioned various causes that might be associated with SM, such as age, level of education, level of income, availability of healthcare facility, marital status, emergency situations.¹³⁻¹⁶ In addition, the Media influentially contributed to invigorating this behavior.¹¹ The primary motivator for the practice of SM was the alleviation of minor ailments, such as cough and headache.¹⁷

Our findings align with those of Chopra D, et al., who reported a significant correlation between self-reported anxiety and self-medication (SM), noting that 60% of self-medicating individuals exhibited high-grade anxiety.¹⁸ Similarly, Al Rasheed F, et al., found increased SM prevalence among students during

examinations, a period marked by heightened academic stress, particularly among medical, nursing, and pharmacy students.¹⁹ Conversely, Gould LF, et al., observed a lower tendency for SM among individuals with extreme emotional distress,²⁰ a finding not supported by our univariate analysis, which showed that moderate to severe anxiety was positively associated with SM. Consistent with this, our study demonstrated a significant relationship between anxiety and SM, whereas associations with stress and depression were not statistically significant. These results suggest that higher anxiety levels are more strongly linked to SM behaviors compared to stress or depression.

The prevalence of self-medication (SM) among university staff in Saudi Arabia is influenced by multiple factors, including time constraints, perceived mildness of symptoms, and limited access to healthcare services. Many employees view medical consultations as time-consuming, leading them to rely on SM as a more convenient alternative. Habib SS, et al., reported a high prevalence of SM in a cross-sectional study involving 383 university employees, with significant associations noted among females, unmarried individuals, and those without children, primarily for conditions such as pain and fever.²¹ Moreover, the perception that certain illnesses are too minor to warrant professional care further contributes to SM, as highlighted by Alshahrani SM, et

al., and Ibrahim NK, et al., who found that many individuals self-medicate for mild ailments based on previous experiences and familiarity with symptoms.^{22,23} This trend underscores the need for targeted interventions to promote responsible medication use and improve healthcare accessibility within academic institutions.^{21,24}

Despite the high rates of SM, there are concerns regarding its safety and efficacy. Critics argue that SM can lead to misdiagnosis and inappropriate treatment, highlighting the need for better healthcare access and education on medication use. Alhur A, et al. conducted a comprehensive, cross-sectional study surveying 1,671 subjects across the diverse regions of the Kingdom, and respondents strongly advocated for increased regulatory measures (87.7%) and a pressing need for enhanced public education (92.6%) to address the risks associated with SM.²⁵ It highlighted the widespread practice of SM in Saudi Arabia, influenced by various factors previously discussed, which underscores the need for targeted health policies and educational campaigns to mitigate these risks.²⁵

Studying SM practices among university staff is crucial due to the potential health risks and economic implications associated with this behavior. Understanding these practices can inform educational interventions aimed at promoting rational drug use and reducing adverse health outcomes. The lack of awareness regarding the risks of SM necessitates targeted health education programs to improve knowledge and practices among university staff, where the prevalence of SM is quite high. This also necessitates the need for further large-scale studies in the university staff population in the kingdom and across the globe, where SM practices are relatively understudied. There are a significant number of studies conducted in the university population that specifically studied these practices in students, undergraduates, and interns, but very few that focused on and studied the university employees.^{26, 27} On the flip side, there is also an argument that SM can empower individuals to manage minor health issues effectively, reducing

the burden on healthcare systems. However, this perspective must be balanced with the potential for misuse and health risks associated with unsupervised medication use.

The Kingdom of Saudi Arabia has addressed SM through a multifaceted approach, though not through specific standalone programs for the university staff population. The Saudi Food and Drug Authority (SFDA) has been actively enforcing drug regulations, including overseeing the registration, documentation, and approval of pharmaceutical products and setting pricing rules to prevent the illicit sales and potentially reduce the illicit use of prescription drugs. While a fully integrated national electronic prescription system has not yet been implemented, the Kingdom's broader Vision 2030 aims to move towards a more traceable system through the digitalization of healthcare, with the "Seha" platform serving as a prime example.

Both the Ministry of Health and SFDA conduct public awareness campaigns emphasizing rational drug use and the dangers of antibiotic resistance, which benefit the university population. Universities with pharmacy programs also empower pharmacists with patient counseling skills, complemented by SFDA's "Guidance on Saudi Food and Drug Authority Policy for Engagement with Healthcare Practitioners," which aims to enhance safe and rational medication use among healthcare professionals. Regarding healthcare access, most large Saudi universities operate comprehensive on-campus health clinics or are affiliated with university hospitals to provide accessible care, and the Kingdom's promotion of telemedicine further improves consultation accessibility. Additionally, university student support services indirectly address drivers of SM like stress, and such programs can be implemented for the university staff too.

Strengths and weaknesses

Even though our study is a cross-sectional study with a relatively small number of participants, it is a very well-constructed study in a very specific portion of society using a very reliable and valid measurement tool (DASS).

CONCLUSION

Self-medication is an emerging behavior, particularly among individuals with underlying mental health concerns. This study found a significant association between SM and anxiety, while no significant link was observed with depression or stress. These findings suggest that individuals experiencing high levels of psychological exhaustion are more likely to engage in SM. Given the potential risks of unsupervised medication use, especially among university employees, there is a pressing need for targeted mental health interventions and awareness campaigns. Pharmacists play a pivotal role in guiding the safe use of over-the-counter drugs, and their proactive involvement is essential in curbing inappropriate SM practices.

REFERENCES

1. Fadhel F. Misuse of prescription drugs and other psychotropic substances among university students: a pilot study. *East Mediterr Health J* 2022;28(4):288-95. <https://doi.org/10.26719/emhj.22.019>
2. Wijesinghe PR, Jayakody RL, de A Seneviratne R. Prevalence and predictors of self-medication in a selected urban and rural district of Sri Lanka. *WHO South East Asia J Public Health* 2012;1(1):28-41. <https://doi.org/10.4103/2224-3151.206911>
3. National Collaborating Centre for Mental Health (UK). Drug misuse: psychosocial interventions. Leicester (UK): British Psychological Society (UK); 2008. (NICE Clinical Guidelines, No. 51.) 3, Introduction to drug misuse. Available from URL: <https://www.ncbi.nlm.nih.gov/books/NBK53217/>
4. Harris KM, Edlund MJ. Self-medication of mental health problems: new evidence from a national survey. *Health Serv Res* 2005;40(1):117-34. <https://doi.org/10.1111/j.1475-6773.2005.00345>
5. Nochaiwong S, Ruengorn C, Thavorn K, Hutton B, Awiphan R, Phosuya C, et al. Global prevalence of mental health issues among the general population during the coronavirus disease-2019 pandemic: a systematic review and meta-analysis. *Sci Rep* 2021;11(1):10173. <https://doi.org/10.1038/s41598-021-89700-8>
6. Patwary MM, Bardhan M, Disha AS, Kabir MP, Hossain MR, Alam MA, et al. Mental health status of university students and working professionals during the early stage of COVID-19 in Bangladesh. *Int J Environ Res Public Health* 2022;19(11):6834. <https://doi.org/10.3390/ijerph19116834>
7. Mkumbo KA. Prevalence of and factors associated with work stress in academia in Tanzania. *Int J Higher Edu* 2014;3(1):1-11. <https://doi.org/10.5430/ijhe.v3n1p1>
8. Marijanović I, Kraljević M, Buho-vac T, Cerić T, Mekić Abazović A, Alidžanović J, et al. Use of the depression, anxiety and stress scale (DASS-21) questionnaire to assess levels of depression, anxiety, and stress in healthcare and administrative staff in 5 oncology institutions in Bosnia and Herzegovina during the 2020 COVID-19 pandemic. *Med Sci Monit* 2021;27:e930812. <https://doi.org/10.12659/MSM.930812>
9. Alduraibi RK, Altowayan WM. A cross-sectional survey: knowledge, attitudes, and practices of self-medication in medical and pharmacy students. *BMC Health Serv Res* 2022;22:352. <https://doi.org/10.1186/s12913-022-07704-0>
10. Al-kubaisi KA, Abdulkareem A, Hassaneim M. Prevalence and associated risk factors of self-medication with over-the-counter medicines among university students in the United Arab Emirates. *Pharm Pract* 2022;20(3):01-06. <https://doi.org/10.18549/pharmpract.2022.3.2679>
11. Kanwal ZG, Fatima N, Azhar S, Chohan O, Jabeen M, Yameen MA. Implications of self-medication

- among medical students-a dilemma. *J Pak Med Assoc* 2018;68(9):1363-7.
12. Daanish AF, Mushkani EA. Influence of medical education on medicine use and self-medication among medical students: a cross-sectional study from Kabul. *Drug Healthc Patient Saf* 2022;14:79-85. <https://doi.org/10.2147/DHPS.S360072>
 13. 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;12:3. <https://doi.org/10.1186/s40545-019-0165-2>
 14. Kifle ZD, Mekuria AB, Anteneh DA, Enyew EF. Self-medication practice and associated factors among private health sciences students in Gondar Town, North West Ethiopia. a cross-sectional study. *Inquiry* 2021;58:4695802. <https://doi.org/10.1177/00469580211005188>
 15. Kassie AD, Biftu BB, Mekonnen HS. Self-medication practice and associated factors among adult household members in Meket district, Northeast Ethiopia, 2017. *BMC Pharmacol Toxicol* 2018;19(1):15. <https://doi.org/10.1186/s40360-018-0205-6>
 16. Chuwa BB, Njau LA, Msigwa KI, Shao E. Prevalence and factors associated with self medication with antibiotics among University students in Moshi Kilimanjaro Tanzania. *Afr Health Sci* 2021;21(2):633-639. <https://doi.org/10.4314/ahs.v21i2.19>
 17. Rashid M, Chhabra M, Kashyap A, Undela K, Gudi SK. Prevalence and predictors of self-medication practices in India: a systematic literature review and meta-analysis. *Curr Clin Pharmacol* 2020;15(2):90-101. <https://doi.org/10.2174/1574884714666191122103953>
 18. Chopra D, Bhandari B, Sidhu JK, Jakhar K, Jamil F, Gupta R. Prevalence of self-reported anxiety and self-medication among upper and middle socioeconomic strata amidst COVID-19 pandemic. *J Educ Health Promot* 2021;10:73. https://doi.org/10.4103/jehp.jehp_864_20
 19. Al Rasheed F, Naqvi AA, Ahmad R, Ahmad N. Academic stress and prevalence of stress-related self-medication among undergraduate female students of Health and Non-Health Cluster Colleges of a Public Sector University in Dammam, Saudi Arabia. *J Pharm Bioallied Sci* 2017;9(4):251-8. https://doi.org/10.4103/jpbs.JPBS_189_17
 20. Gould LF, Hussong AM, Hersh MA. Emotional distress may increase risk for self-medication and lower risk for mood-related drinking consequences in adolescents. *Int J Emot Educ* 2012;4(1):6-24.
 21. Habib SS, Al-Khlaiwi T, Almushawah A, Alsomali A, Bin Ateeq AAA, Aljarrah FA, et al. Prevalence and association of self-medication practices with personal and educational factors among university employees of Saudi Arabia: a cross-sectional study. *J Family Med Prim Care* 2024;13(11):5225-30. https://doi.org/10.4103/jfmpc.jfmpc_337_24
 22. Alsha hrani SM, Alavudeen SS, Alakh-ali KM, Al-Worafi YM, Bahamdan AK, Vigneshwaran E. Self-medication among King Khalid University Students, Saudi Arabia. *Risk Manag Healthc Policy* 2019;12:243-249. <https://doi.org/10.2147/RMHP.S230257>
 23. Ibrahim NK, Alamoudi BM, Baamer WO, Al-Raddadi RM. Self-medication with analgesics among medical students and interns in King Abdulaziz University, Jeddah, Saudi Arabia. *Pak J Med Sci* 2015;31(1):14-8. <https://doi.org/10.12669/pjms.311.6526>
 24. Elghazaly A, Alsahali S, Farooqui M, Ibrahim N, Alshammari M, Almutairi A, et al. A cross-sectional study to investigate the prevalence of self-medication of non-opioid analgesics among medical students at Qassim University, Saudi Arabia. *Patient Prefer Adherence* 2023;17:1371-9. <https://doi.org/10.2147/PPA.S407693>
 25. Alhur A, Alhur A, Alfayiz A, Alotaibi A, Hansh B, Ghasib N, et al. Patterns and prevalence of self-medication in Saudi Arabia: insights from a nationwide survey. *Cureus*. 2023 Dec 29;15(12):e51281. <https://doi.org/10.7759/cureus.51281>
 26. Okyay RA, Erdoğan A. Self-medication practices and rational drug use habits among university students: a cross-sectional study from Kahramanmaraş, Turkey. *Peer J* 2017;5:e3990. <https://doi.org/10.7717/peerj.3990>
 27. Alomoush A, Alkhawaldeh A, Al-Bashtawy M, Hamaideh S, Ta'an W, Abdelkader R, et al. Self-medication and its associated factors among university students: a cross-sectional study. *Iran J Nurs Midwifery Res* 2024;29(2):268-71. https://doi.org/10.4103/ijnmr.ijnmr_302_22

AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

SSH, TAk, AbAlm & AbAls: Conception and study design, acquisition, analysis and interpretation of data, drafting the manuscript, critical review, approval of the final version to be published

SMH & HAK: Acquisition of data, drafting the manuscript, approval of the final version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest, whether financial or otherwise, that could influence the integrity, objectivity, or validity of their research work.

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DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request



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