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Factors Associated with Using of Sleeping Aid Medications Utilization among Medicine Students: A Cross-Sectional Study in Jordan.

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A B S T R A C T

Background: Sleep is a physiological process that maintaining overall health, yet it is frequently compromised due to various sleep disorders. Medical students, due to their rigorous academic schedules and high stress levels, are particularly vulnerable to sleep disturbances, often resorting to sleeping aid medications as a coping mechanism.

Aims: This study aims to assess the prevalence, determinants, and implications of sleep-aiding medication use among Jordanian university students, with a particular focus on medical students.

Methods: A cross-sectional study was conducted between January and March 2024 using an online self-administered questionnaire. A total of 525 responses were collected, with 524 meeting the inclusion criteria. The survey assessed demographic data, health and lifestyle factors, general sleep-aid medication usage, and specific details on medication types and side effects. Data were analyzed using Fisher's Exact Test to assess associations between variables, with statistical significance set at $P < 0.05$.

Results: The results showed that 48.7% of respondents suffered from insomnia, while 60.50% reported experiencing psychological stressors impacting their sleep. Although 90% of respondents reported rarely using sleep-aiding medications, 6.3% used them once or twice a week, and 3.7% used them more frequently. Antihistamines (44.2%) and melatonin (25%) were the most commonly used sleep aids, with 82.7% obtaining them over the counter. Significant associations were found between sleep-aid medication use and factors such as smoking, insomnia, diagnosed psychiatric conditions, obesity, and screen time before sleep ($P < 0.05$).

Conclusions: These findings indicate the importance of promoting non-pharmacological sleep management strategies and enhancing student awareness of the risks associated with chronic use of sleeping aids.

Keywords: Insomnia, medical students, sleep-aiding medication, sleep disorders, stress, well-being.

Introduction

Sleep is a major component of health and is as pivotal as nutrition and exercise in the determination of individual well-being (1). It is important for learning, memory processing, brain recovery, mood control, and metabolic control. The overall quality of sleep is determined by several key factors including smoking, duration, and caffeine consumption and is subject to compromise due to various sleep disorders (2).

Sleep disorders are conditions that affect the quality or amount of sleep an individual can get at night. Common sleep disorders include insomnia, a condition characterized by difficulties in falling asleep or maintaining sleep throughout the night (3), restless legs syndrome which is characterized by an uncomfortable urge to move the legs while at rest (4), narcolepsy a rare brain disorder that reflects a selective loss or dysfunction of orexin neurons of the lateral hypothalamus. (5), and sleep apnea (6).

Sleeping aid pills are a class of pharmacological agents encompassing both over-the-counters and prescription medications designed to alleviate some of sleep disorders. Sleeping pills, primarily benzodiazepines, nonbenzodiazepine omega receptor agonists, antidepressants, selective gamma aminobutyric acid (GABA) agents, and antihistamines, are widely used to reduce the sleeping disturbances (7). While these drugs are quite effective, they do have side effects that patients should be aware of such as headaches, dizziness, diarrhea, constipation, weakness, and dry mouth. They may also lead to some serious side effects such as heartbeat irregularities, breathing difficulties, chest pain, and swelling up of the eyes, lips, face, tongue, or throat (8). Thus, these agents should preferably only be used after consulting a physician. It is worth noting that approximately 2–5% of sleeping pill users are adults in their twenties, while most are older adults and women (9).

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Turning our attention specifically to the medical student demographic, it was found these students facing a challenging journey constituted by an extensive curriculum, demanding clinical rotations, and the responsibility of preparing for careers in healthcare. These stressors render them susceptible to sleep disturbances. In fact, a cross-sectional study was conducted in King Saud bin Abdulaziz University for Health Sciences - Saudi Arabia using a random sample of male and female medical students aiming to assess sleep quality using the Pittsburgh Sleep Quality Index, and the stress level by using the Kessler Psychological Distress Scale. The results of this study were a high prevalence of poor sleep quality (76%) and stress (53%), with a statistically significant association ($P < 0.001$). Logistic regression indicated that students who are not suffering from stress are less likely to have poor sleep quality (OR = 0.28, $P < 0.001$), and the risk of having poor sleep quality is almost four times higher in students whose grade point average is less than 4.25 (OR = 3.83, $P = 0.01$) (10). Thus, and as a consequence of the stress they experience, medical students exhibit an increased tendency to turn to sleeping aid medications as a coping mechanism.

The increasing reliance on sleeping aid pills among medical students raises some significant questions: What factors drive these students to seek sleeping aids? How prevalent is the use of these pills in the medical student population? What are the potential benefits and risks associated with their use? The hypothesis is that medical students, due to the stressful lifestyle they endure, use sleeping aid pills more than their counterparts in other fields of study.

While previous studies have explored sleep patterns among university students globally, limited local evidence exists regarding sleeping aid medication use specifically among medical students in Jordan. This study fills this gap by assessing not only the prevalence of sleeping pill usage but also its association with lifestyle and health-related factors.

As the literature remains relatively scant on the subject, this study aims to assess the prevalence, determinants, and implications of sleep-aiding medication use among Jordanian university students, with a focus on medical students. The specific objectives were: to estimate the prevalence of sleeping aid medication use among medical students in Jordan, to identify sociodemographic and lifestyle factors associated with such use, to evaluate awareness of side effects and addiction potential among users, and to explore the role of psychiatric conditions and stress in influencing medication use.

Methods

Participants

A cross-sectional study was carried out between January and March 2024 in Jordan where a self-administered online questionnaire survey was conducted targeting Jordanian university students.

Sample Size Calculation: The required sample size was calculated using SPSS software based on an estimated population proportion of 50%, a 95% confidence level, and a 5% margin of error, resulting in a minimum sample size of 385 participants. A total of 525 responses were collected to allow for possible exclusions.

Inclusion Criteria: Undergraduate students currently enrolled in any Jordanian university during the 2023–2024 academic year.

Exclusion Criteria: Non-university students, incomplete questionnaires, and those who did not provide informed consent.

Ethical Considerations

Informed consent was obtained and anonymity was insured before the students answered the survey. The design of the study was approved by the ethical committee at the Faculty of Medicine, Al-Balqa' Applied University (REF number BAU-MED-2024-007).

Sampling Technique

A convenience sampling method was employed. While stratified sampling would have enhanced representativeness, our sample included participants from multiple universities across different regions of Jordan.

Questionnaire

The survey consisted of 31 questions grouped into four different sections as follows:

Demographics including sex, age, occupational status, place of residence, university major, year of study, academic status, and university attendance.

Health factors influencing sleep including insomnia, smoking, psychological stress, chronic diseases, sleep breathing difficulties, diagnosed psychiatric conditions, obesity, the belief that certain foods affect quality of sleep, caffeine intake less than 4 hours before sleep, regular sleep schedules, screen time less than 30 minutes before sleep, and regular exercise.

Questions regarding use of sleep-aiding medication including frequency of usage, awareness of possible side effects, and the belief that chronic use of sleep-aiding medications could lead to addiction or dependence.

Specific details about the medications used including type of medication used, method of dispensing medication, usage of sleep-aiding medication to alleviate stress, fear of addiction/dependence, previous attempts at non-pharmacological treatments for sleep disorders, difficulty waking up after using the medication, previous attempts to discuss sleeping problems with a specialist, and seasons of increased demand for the medication if any.

Some variables followed an ordinal scale of measurement, including age, year of study, and days of required university attendance. However, most of the measured variables followed the dichotomous scale including all the variables stated in the second section. The frequency of pill's usage was assessed using a Likert scale as follows: rarely, once or twice a week, three or four times a week, five times a week or more. The survey was designed so that the last section would only be undertaken by the participants who indicated a frequency of pill usage of "once or twice a week" or more in the previous section.

Prior to distribution, the questionnaire was reviewed by an expert in the field of pharmacology to ensure its quality. In addition, the questionnaire was distributed among 50 students and the results were analyzed as a pilot study to ensure the consistency of

the questions and to receive any feedback about the questionnaire. The value Cronbach's Alpha of the questions in this survey was 0.78.

Online posts including a brief description of the questionnaire and its goals and a link to the online survey in a Google Form (https://forms.gle/VxQkoovuWiArpBFz5) were shared by our research team on multiple social media platforms. Responses were collected between the 24th of January 2024 and the 3rd of March 2024. Upon entering the link, the enrolled students were asked to confirm their consent after reading the stated goals and procedures of the study and prior to continuing on to the questions. Among the 525 responses, one response was discarded as it failed to meet the inclusion criteria of that the respondent was a high school student and was not enrolled in an undergraduate program at a Jordanian university.

Statistical Analysis

After completion of the data collection process, all the variables in the first two sections were investigated as independent variables for any possible significant correlations with the frequency of medication usage as the dependent variable. This investigation was conducted using the Fisher Exact Test using SPSS statistics. The study had a simple random sample of 525 students also calculated using SPSS software and estimated at a 95% confidence interval (CI) and a 5% margin of error. The significance level was set at p value < 0.05.

Results

Demographics and Participant Characteristics

The demographic data of participants are illustrated in Table 1. Of the 525 responses, 1 response was excluded as it failed to meet the inclusion criteria. The majority of respondents were female (77.5%). The highest rate of response was from the 18–20-year age group at 67.7% of responses. Most survey-takers were unemployed (91.8%), with the rest either in full-time or part-time employment. Responses came mostly from subjects residing in the middle governorates of Jordan (81.1%). On an academic level, 42.9% of participants indicated their university major as “doctor of medicine”. This was the majority group and the remaining 57.1% of respondents indicated various fields with the most common being “other medical sciences” (15.5%) and “technical/computer majors” (10.5%). Most responses (43.3%) came from students in their third year of study. Course attendance varied but the most common indication was four days per week (31.5%). Most students (85.1%) indicated that their academic status according to their plan was “on track”, as opposed to being ahead, being delayed, or having failed and repeated a year or more.

Health and Lifestyle Factors

Almost half of the respondents (48.66%) reported suffering from insomnia, and 60.50% of subjects acknowledged experiencing psychological stressors that affect their quality of sleep. Moreover, 94.66% of respondents affirmed that they use their mobile phones, televisions, computers, or similar devices less than 30 minutes before sleep. The other health-related findings were as follows: 21.76% of subjects indicated that they suffer from diagnosed psychiatric conditions, 20.04% were smokers, 9.54% were obese, and 7.82% had chronic diseases. In addition to these findings, only 23.09% of survey-takers had regular sleep schedules and only 18.13% engaged in regular exercise. About 81.11% shared a belief that certain foods and eating habits can cause sleeping problems and when asked about their caffeine consumption, 38.55% of participants reported consuming caffeine less than 4 hours before bed. The health and lifestyle data of participants in this study are shown in Table 2.

General Medication Usage and Knowledge

Most respondents rarely used sleep-aiding medication (90%), with smaller percentages using them once or twice a week (6.3%), three or four times a week (0.8%) and five times a week or more (2.9%) Table 3. Few respondents were aware of the general side effects of sleeping aid pills (38.7%). However, the percentage of people who believed that these drugs could lead to addiction or dependence was significantly higher at 89.9%, as shown in Table 3.

Medication Usage Specifics and Side Effects

This section of the survey was only undertaken by respondents who indicated a frequency of pill usage of “once or twice a week” or more in the previous section. The most commonly used sleep-aiding medications were antihistamines at 44.24% followed by melatonin at 25%, antidepressants at 11.54%, and vitamins and herbal supplements at 11.54% Table 4. Most subjects (82.7%) reported purchasing their medication over the counter and only 17.3% reported having a prescription. Overall, there was no seasonal trend in demand according to 65.4% of responses. However, some students reported an increase during the winter (17.3%). Additionally, 61.5% of respondents acknowledged using sleeping aids to alleviate stress, as shown in Table 4.

In terms of the adverse effects induced by these drugs, about 59.6% of the participants using sleeping drugs had concerns about addiction or dependence. It was also noted that 51.9% of the participants experienced difficulties waking up in the morning after using some of these drugs, as illustrated in Table 4. A striking majority (71.2%) of the students avoided consultation with a specialist about their sleep difficulties and preferred to attempt to address this problem by themselves. However, 59.6% of the students taking sleeping aid drugs had previously attempted non-pharmacological treatment approaches to their sleeping problems Table 4.

Factors associated with frequency of sleep-aiding medication usage in the analyses conducted, the dependent variable considered was the frequency of sleep-aiding medication usage and its association was tested with every variable from the first two sections being considered as an independent variable (as mentioned previously in the methodology).

Smoking, insomnia, and diagnosed psychiatric conditions all showed a significant association with frequency of sleep-aiding medication usage with a P-value < 0.001. There were also other factors that showed significant links including obesity (P =0.014), screen device usage less than 30 minutes before sleep (P =0.01), and the belief that chronic usage of sleep-aiding medication could lead to dependence and addiction (P <0.001). The other variables considered, including university major of study, exhibited no significant association with frequency of sleep-aiding medication usage and all had a P value greater than 0.05.

Table 1. Demographics and participant characteristics.

Parameter	Frequency (%)
Sex	
Female	406 (77.5%)
Male	118 (22.5%)
Total	524 (100%)
Age (years)	
Under 18	1 (0.2%)
18-20	355 (67.7%)
21-24	155 (29.6%)
25 or older	13 (2.5%)
Total	524 (100%)
Occupational status	
Full-time employee	18 (3.4%)
Part-time employee	25 (4.8%)
Unemployed	481 (91.8%)
Total	524 (100%)
Place of residence	
Middle governates	425 (81.1%)
Northern governates	74 (14.1%)
Southern governates	25 (4.8%)
Total	524 (100%)
University major	
Agriculture	10 (1.9%)
Arts / Design	16 (3.1%)
Basic Sciences	4 (0.8%)
Business majors	53 (10.1%)
Dentistry	22 (4.2%)
Doctor of medicine	225 (42.9%)
Engineering (including architecture)	35 (6.7%)
Law	5 (1.0%)
Linguistics	11 (2.1%)
Other medical sciences	81 (15.5%)
Others	7 (1.3%)
Technical / computer majors	55 (10.5%)
Year of study	
1st	114 (21.8%)
2nd	120 (22.9%)
3rd	227 (43.3%)
4th	51 (9.7%)
5th	9 (1.7%)
6th	3 (0.6%)
Total	524 (100%)
University attendance	
0 (All lectures are given online)	28 (5.3%)
One day per week	19 (3.6%)
Two days per week	29 (5.5%)
Three days per week	161 (30.7%)
Four days per week	165 (31.5%)
Five days per week	122 (23.3%)
Total	524 (100%)
Academic status	
Ahead of plan	15 (2.9%)
Delayed	40 (7.6%)
Failed (repeated 1 or more years)	23 (4.4%)
On track	446 (85.1%)
Total	524 (100%)

Table 2. Health and lifestyle factors of participants.

Parameter	Frequency (%)
Insomnia	
Yes	255 (48.66%)
No	269 (51.34%)
Total	524 (100%)
Smoking	
Yes	105 (20.04%)
No	419 (79.96%)
Total	524 (100%)
Psychological stress	
Yes	317 (60.50%)
No	207 (39.50%)
Total	524 (100%)
Chronic diseases	
Yes	41 (7.82%)
No	483 (92.18%)
Total	524 (100%)
Sleep breathing difficulties	
Yes	66 (12.60%)
No	458 (87.40%)
Total	524 (100%)
Diagnosed psychiatric conditions	
Yes	114 (21.76%)
No	410 (78.24%)
Total	524 (100%)
Obesity	
Yes	50 (9.54%)
No	474 (90.46%)
Total	524 (100%)
Do you believe certain foods / eating habits can cause sleep disturbances?	
Yes	425 (81.11%)
No	99 (18.89%)
Total	524 (100%)
Caffeine consumption	
Yes, and I consume it <4hrs before bed	202 (38.55%)
Yes, but I avoid consuming it <4hrs before bed	172 (32.82%)
No	150 (28.63%)
Total	524 (100%)
Regular sleep schedule	
Yes	121 (23.09%)
No	403 (76.91%)
Total	524 (100%)
Screen time less than 30 minutes before sleep	
Yes	496 (94.66)
No	28 (5.34%)
Total	524 (100%)
Regular exercise	
Yes	95 (18.13%)
No	429 (81.87%)
Total	524 (100%)

Table 3. General medication usage and knowledge among university students participated in this study.

Parameter	Frequency (%)
Frequency of using sleeping aid drugs	
Rarely	472 (90%)
Once or twice a week	33 (6.3%)
Three or Four times a week	4 (0.8%)
Five times a week and more	15 (2.9%)
Total	524 (100%)
Awareness of side effects of sleeping aid drugs	
Yes	203(38.7%)
No	321(61.3%)
Total	524(100%)
Do you believe that chronic use of sleeping aid drugs could lead to addiction or dependence?	
Yes	471(89.9%)
No	53(10.1%)
Total	524(100%)

Table 4. Medication usage specifics and side effects among the student participants.

Parameter	Frequency (percentage)
Type of medication used	
Antihistamines	23 (44.24%)
Anti-depressants	6 (11.54%)
Melatonin	13 (25%)
Vitamins and Herbal Supplements	6 (11.54%)
Muscle Relaxants	1 (1.92%)
Allergy medications that contain sedation	1 (1.92%)
Swanson 250mg	1 (1.92%)
Proxfen-Flamex-Relaxation	1 (1.92%)
Total	52 (100%)
Dispensing methods	
Prescription	9 (17.3%)
Over the counter	43 (82.7%)
Total	52 (100%)
Use of sleeping aid drugs to alleviate stress	
Yes	32 (61.5%)
No	20 (38.5%)
Total	52 (100%)
Fear of addiction / dependence to sleeping aid drugs	
Yes	31(59.6%)
No	21(40.4%)
Total	52(100%)
Previous attempts of non-pharmacological treatments for sleep	
Yes	31(59.6%)
No	21(40.4%)
Total	52(100%)
Difficulty waking up after taking sleeping aid drugs	
Yes	27(51.9%)
No	25(48.1%)
Total	52(100%)
Discussing of sleeping problems with a specialist	
Yes	15(28.8%)
No	37(71.2%)
Total	52(100%)
Seasonal demand peaks	
Spring	3 (5.8%)
Summer	5 (9.6%)
Autumn	1 (1.9%)
Winter	9 (17.3%)
No specific season	34 (65.4%)
Total	52 (100%)

Discussion

Insomnia is a common health concern among university students globally (8). This study explored the use of sleeping aid pills among Jordanian university students, identifying associated factors, reported side effects, and potential psychiatric links. There is a lack of local research on this topic. The findings offer valuable insights into students' behaviors and awareness regarding sleep medication use.

The majority of respondents were female (77.5%), though this was not statistically significant. This may reflect the gender distribution in Jordanian universities, where female enrollment is higher (11). Most participants (81.1%) resided in central governorates, likely due to the greater number of universities in that region.

Although 48.7% of students reported insomnia symptoms, 90% used sleep aids infrequently. This may be due to awareness or prior experiences of side effects, such as subjective cognitive decline, dry mouth, headaches, and digestive issues (12). Sleep aids are also known to exacerbate snoring and sleep apnea and are often used only during periods of anxiety (8).

Behavioral contributors to poor sleep were prevalent. Nearly all students (94.7%) reported screen use within 30 minutes before sleep. A significant portion also consumed caffeine (38.6%) or smoked (20%) close to bedtime. These habits have been associated with poor sleep quality in previous studies (15–17). Such behaviors may partly explain the high insomnia rates observed. Irregular sleep patterns were reported by 76.9% of respondents. Disruption of circadian rhythms is known to affect sleep quality (18), and in this study, it was associated with higher sleep aid use. Diet was another perceived factor, with 81.1% of participants believing that certain foods or eating habits impacted their sleep. This reflects some awareness of diet–sleep interactions (19), though evidence on whether dietary changes can replace medication remains limited and inconclusive (20).

Most students recognized the risk of dependence on sleeping pills, suggesting a basic understanding of their potential dangers. Misuse of over-the-counter (OTC) sleep aids, including excessive or combined use, has been linked to dependency (21–23).

Antihistamine-based sleep aids were the most commonly used medications, followed by melatonin, antidepressants, and herbal supplements. These are easily accessible in Jordan and often cheaper than other options. However, they are not recommended for chronic insomnia due to limited evidence of long-term safety

and effectiveness (24). Antihistamines promote sedation through histamine receptor antagonism but may cause anticholinergic side effects (8, 25).

Although ramelteon is a melatonin receptor agonist approved for insomnia, it was rarely reported by participants, possibly due to its prescription-only status and limited local availability (24). Most respondents obtained medications OTC rather than by prescription. This is consistent with national data indicating frequent unsupervised use of OTC products. The accessibility of community pharmacists and favorable public perception likely encourage this behavior (25, 26). Only a minority consulted healthcare professionals. This may be due to students' busy schedules, financial concerns, or sociocultural barriers. Prior studies show that individuals with intermittent sleep issues often prefer non-pharmacologic approaches, such as sleep hygiene or OTC agents, over seeking medical advice (23).

There are some limitations in this study, this study relied on self-reported data, which may introduce response bias. Additionally, the focus on university students excludes other population groups who may exhibit different patterns of sleep aid usage.

Conclusions

This study helps us understand how common it is for university students in Jordan to use sleep-aiding medications and what factors are related to their use. The results show that many students, especially females, rely on these medications. The study highlights the need for other ways to manage sleep problems and to raise awareness about the risks of using these medications without medical advice.

Conflict of Interest

Authors declare that there is no conflict of interests.

Availability of Data

Data are available with the corresponding author upon request.

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