

Medical and nonmedical use of psychiatric medications among medical students in Riyadh, Saudi Arabia

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ABSTRACT

Introduction: Psychiatric medication use has increased recently among college students. This includes antidepressants, opioids, stimulants, analgesics, sedatives, and anxiolytics, which could be self-administered without medical supervision. **Objectives:** To determine the prevalence of medical and nonmedical use of psychiatric prescription medications and its correlation with academic performance, demographic data as well as the motives for the nonmedical use. **Methods:** A cross-sectional study aims to assess the psychiatric medication use with or without prescription with the motives behind it, and demographic data of the students at medical colleges in Riyadh, Saudi Arabia. **Results:** A total of 1268 responded to the questionnaire. 251 (20%) of the participants reported using some psychiatric medications in their lifetime, while 191 (15%) participants used some psychiatric medications in the last 12 months. Antidepressants were most used in the surveyed population 144 (57%), followed by opioids/pain relief medications 62 (24%) and anxiolytics 39 (15%). Only 44 surveyed students (3.5%) reported nonmedical use of these psychiatric medications. As for the motives of nonmedical use, the greatest portion reported to use it for “relax or relieve tension” 12 (29%), followed by “relieve pain caused by other health problems” 8 (20%), and “medication to get through the day” 6 (15%). **Conclusion:** Nonmedical use of psychiatric medications among medical students in Riyadh is several times lower than reports by other researchers. Future research should focus on collecting more participants who are using medications without prescription and conduct cross-cultural studies to examine factors contributing to such low rates of illicit psychiatric medication use.

Keywords: Medical students, misuse, motives, nonmedical use of prescription drugs, prevalence, psychiatric medications

Introduction

The nonmedical use of psychiatric medications (NMUPM) is an increasing public health concern.^[1] The use of prescribed medications without supervision or use of a prescribed drug in a way that does not adhere to the prescription is termed as NMUPM.^[2] Nonmedical use of prescription medications includes psychiatric medications such as antidepressants,

opioids, stimulants, analgesics, sedatives, and anxiolytics, which may be self-administered without any medical prescription or supervision. Many national studies in the United States provide strong evidence that the nonmedical use and abuse of prescription medications, especially opioids, represents an increasing problem among young adults and college students.^[3] This trend also termed nonmedical use of psychiatric medications (NMUPM) or prescription drug misuse is particularly evident in college populations, such that prevalent studies indicate that roughly 20% of college students report lifetime use of either stimulants, analgesics, anxiolytics, or sedatives.^[4] NMUPM has many dangerous complications as

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it has shown an association with subsequent suicidal ideation, suicidal attempts, and fatalities by overdose.^[5]

Furthermore, the latest research reveals that the nonmedical use of prescription of benzodiazepine anxiolytics among college students has reached its highest level in the past two decades; one in every ten college students shows nonmedical use of these medications during their lifetime.^[6] However, most of these studies offer only a narrow understanding of the correlates associated with the nonmedical use of benzodiazepines or other anxiolytics. Regarding The National Survey on Drug Use and Health (NHSDA) data 2001, the highest prevalence of nonmedical use of prescription drugs is between 18–25 years of age.^[6] Thus, it has become necessary to develop prevention and intervention programs for nonmedical prescription drug use, especially among young adult populations.^[7]

Notably, a study conducted in King Saud University in Riyadh, Saudi Arabia, for a sample of 729 medical students has found that 17.0% reported sedative drug use during their enrolment. Further associated factors were determined, including higher academic year, lower grade point average, less exercise duration, fewer hours of sleep per day, lower quality of sleep, and sleeping disorders.^[8]

Moreover, a recent study regarding the illicit use of stimulants alone concluded that 1177 medical students in Riyadh, 29 (2.46%) use stimulants nonmedically, while 39 (3.31%) use them medically under physician supervision due to ADHD.^[9] However, no further studies were found to demonstrate other psychiatric medications, whether medically or nonmedically.

In addition, frequent studies concluded unsatisfactory mental health conditions among medical students compared with the general population. A systematic review with 40 articles of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students indicated a high rise in overall prevalence of depression and anxiety compared with their peers.^[10]

Similarly, other systematic reviews in Brazil,^[11] Asia,^[12] and outside North America^[13] have reported the same conclusion that the prevalence of depression and anxiety among medical students is substantially higher when compared with the general population.

Moreover, a recent study published in 2020 shows that 3766 medical students from twelve countries across five continents experience more psychiatric symptoms along with high levels of substance misuse and burnout.^[14]

While the young population who attended primary care, 15.4% had moderate to severe depression out of 384 patients.^[15] Moreover, mental disorders such as depression, anxiety, somatization, or panic disorders were generally found in 28.9% out of 431 outpatients in primary care clinics in central Saudi Arabia.^[16] 90% of family medicine physicians support the need for collaboration

between primary care physicians and psychiatrists to provide optimal care due to the rising numbers of mental disorders.^[17]

Despite previous studies looking at the nonmedical use of specific psychiatric medications or all types of drugs, no study was conducted in Saudi Arabia that specifically focuses on the medical use and nonmedical use of psychiatric medications. The medical field is one of the most demanding fields that require both high commitment and effort while being in good mental shape is a crucial thing to become a professional medical provider.^[18] Thus, our study was designed to demonstrate the prevalence of medical and nonmedical use of psychiatric prescription medications in medical students and its correlation with the academic performance, demographics, motives behind it, and any effects that may arise.

Subjects and Methods

Anonymous web-based cross-sectional study was conducted in Riyadh, Saudi Arabia from July 2020 to August 2020 to observe and explore the prevalence of medical and nonmedical use of psychiatric prescription medications among medical students. Institute Review Board of the IMISU no. HAPO-01-R-011 has approved to conduct the study to start and distribute an online form questionnaire, which was sent to approximately 4000 medical students in Riyadh through data collectors from each medical college in Riyadh within the same medical year accordingly. Reminders were sent to students every week with a questionnaire assessing psychiatric medications use with or without a prescription, motives of the nonmedical use, as well as demographic data including Al-Imam Muhammad Bin Saud Islamic University College of Medicine, King Saud University, Riyadh College of Medicine, King Saud bin Abdulaziz University for Health Sciences College of Medicine, Princess Nourah Bint Abdulrahman University College of Medicine and Other Colleges of Medicine. 1268 responded with a response rate of 32% of the participants overall.

A validated questionnaire was used in a previous study in which the permission to use and edit has been taken from the author.^[11] It contains various types of psychiatric medications with their generic names and trade names. However, the generic and trade names of the medications included in this study have been checked through the Saudi Food and Drug Authority website to ensure their availability in the Saudi Arabia pharmaceutical market.^[19]

Regarding the motivations for nonmedical use of prescription medications, the motives elements were adopted from an open public data of monitoring the future (MTF) study, which collects longitudinal nationally representative data from the United States. Surveys have been carried out each year since 1975 by the University of Michigan Survey Research.^[20]

The inclusion criteria were as follows: Medical students from the first year to internship, age over 18, and who consent to

participate in the study. Those who did not consent, complete the survey, and those who are not residents of Riyadh were excluded.

The questionnaire is composed of demographics variables (age, gender, college association, and cumulative GPA) the prevalence of psychiatric medications use, whether they were consumed during last week, last 3 months, last 12 months, or during their lifetime, the type of medications—antianxiety medications (e.g., Diazepam), antidepressants (e.g., SSRI, TCA, MOA), neuroleptics medications (e.g., Clozapine, Risperidone), and opioids/pain medications (e.g., Oxycodone)—and the motives of use for the nonmedical users.

Statistical tests were carried out to determine which groups are especially prone to psychiatric medication use regardless of whether they are using with or without a prescription. In order to test the likelihood of psychiatric medication use in various groups, a Chi-square test of independence was used. To compare between the medical and nonmedical use of these medications, Z-tests were computed with Bonferroni correction for comparisons within the same variables using SPSS software for statistical analysis, which are participants' medication type, gender, year of studies, GPA and university.

Results

Table 1 shows the demographic details of our sample regarding their age, gender, academic year, university, and GPA.

A diverse sample of 1268 students enrolled at different medical schools in Riyadh, Saudi Arabia was surveyed from July 2020 to August 2020 about their use of psychiatric drugs. 33% of the total sample was comprised of students of Al-Imam Muhammad Bin Saud Islamic University (IMSIU), while an additional 30% are from King Saud bin Abdulaziz University for Health Sciences College of Medicine (KSAUHS); a total of 20% of the sample came from the Princess Nourah Bint Abdulrahman University (PNU), and 16% of participants were enrolled at King Saud University (KSU) at the time of the survey. Around 1.4% of the participants were listed as “other,” which indicates nongovernmental medical colleges. 53% of the sample are female, and 98% of participants are between 18 and 26 years of age (28% between 18 and 20, 59% between 21 and 23, and 11% between 24 and 26). 49% of them reported a GPA higher than 4.5. An additional 32% reported a GPA between 4.0 and 4.5, while 14% reported an average grade between 3.5 and 4.0. Less than 5% of the total sample reported a GPA of 3.5 or lower. The sample was evenly split between 49% students at a preclinical level of study (1st, 2nd, and 3rd year – 13%, 17%, and 19%, respectively) and 51% at the clinical level of study (4th, 5th, and internship – 27%, 19%, and 5%, respectively).

Table 2 provides the prevalence rates for each type of psychiatric medication and with their last time of consumption.

Table 3 shows the number count and standardized residual of students whether they have used any psychiatric medication or not during their academic year.

Furthermore, the conducted tests showed that there is a strong relationship between academic year and the likelihood to use psychiatric medications ($\chi^2 (3) = 24.78, P < 0.001$). When looking at this connection at a deeper level, the standardized residual is the difference between the observed count and the expected count and the standard deviation of the expected count in Chi-square testing. If the residual is less than -2 , the cell's observed frequency is less than the expected frequency, while greater than 2 , the observed frequency is greater than the expected frequency.

Based on that, it is shown that 1st and 2nd year students are much less likely to use psychiatric medication than expected, while internship-year students are the ones who are most likely to use that type of medication than expected. Students of the 3rd, 4th, and 5th year all have an above-average likelihood of using psychiatric drugs, although not as high likelihood as internship students do.

Table 4 illustrates the correlation of the use of psychiatric medication with the student's GPA.

When it comes to the connection between GPA and medication use, it is statistically significant ($\chi^2 (4) = 32.07, P < 0.001$), although not necessarily pointing in the expected direction. Students with the highest GPAs (4.5+) tend to use less than average psychiatric medication than what was expected based on the standardized residual value.

Those with a grade point average between 4.5 and 4.0 have an average likelihood of using said medications, while those with lower GPAs are much more likely to be using psychiatric medications more than what was expected in the result.

Moreover, the analysis of the relationship between university or origin and the probability of using psychiatric medication did not show a statistically significant link ($\chi^2 (5) = 4.75, P = 0.314$).

Delineating medical and nonmedical use

To further understand the profile of the students using psychiatric drugs without medical prescription, additional comparison tests are carried out. These tests are conducted only on participants who have reported on using psychiatric drugs ($N = 251$). In this subpopulation, a group of students using the drugs with adequate prescription ($N = 207$) is compared against the group that is using them without the prescription ($N = 44$). Table 5 illustrates the differences between the groups.

Table 5 shows a comparison of demographic profiles between the groups of prescription and nonprescription use, which are

Table 1: Demographic data of participants

	Count	Column n %
Age		
18-20	361	28.4%
21-23	752	59.0%
24-26	133	10.5%
Above 26	22	1.7%
Gender		
Male	598	47.0%
Female	670	53.8%
Academic year		
1 st Year	167	13.1%
2 nd Year	220	17.3%
3 rd Year	237	18.6%
4 th Year	340	26.8%
5 th Year	246	19.4%
Internship year	61	4.8%
University		
Al-Imam Muhammad Bin Saud Islamic University College of Medicine	412	32.5%
King Saud bin Abdulaziz University for Health Sciences College of Medicine	384	30.3%
King Saud University, Riyadh College of Medicine	200	15.8%
Princess Nourah Bint Abdulrahman University College of Medicine	254	20.0%
Others	18	1.4%
GPA		
>4.5	625	49.3%
Between 4.5 and 4.0	406	32.0%
Between 4.0 and 3.5	178	14.0%
Between 3.5 and 3.0	42	3.3%
Between 3.0 and 2.5	14	1.1%
<2.5	3	0.2%

Table 2: Prevalence rates for use of different psychiatric medications and time of use

	Lifetime		Last 12 months		Last 3 months		Last week	
	n	%	n	%	n	%	n	%
Medication use [total]	251	20.0%	190	15.0%	138	10.9%	76	6.0%
Antidepressants	144	11.3%	109	8.6%	89	7.0%	58	4.6%
Pain relief	62	4.9%	45	3.5%	25	2.0%	10	0.8%
Anxiolytics	39	3.1%	32	2.5%	21	1.7%	7	0.6%
Neuroleptics	6	0.5%	4	0.3%	3	0.2%	1	0.1%
No prescription	44	3.5%	36	2.8%	25	2.0%	7	0.6%

fairly similar. However, there are some important differences to note. First, it was shown that men are statistically significantly more likely to be nonprescription users than women are (out of all nonprescription users 65.9% are men). Second, an important difference in the type of medication used has been observed. While those who use psychiatric medications with adequate prescription mainly use antidepressants (more than 65%), a different pattern of results emerges in the nonprescription group—these students mostly use opioids or pain meds (54.5%) or antianxiety medications (29.5%).

Table 6 provides the motives for using the psychiatric medications and their count.

Students who reported using psychiatric medications without a prescription from a medical professional have provided information about their motives, which can shed additional light on this phenomenon though only a small number of participants (total of 44) indicated their motives.

Discussion

The prevalence of psychiatric medications use among the medical student population in Riyadh is lower than in some of the previous studies. Our sample shows only a 3.5% prevalence rate for a lifetime nonmedical use and 2.8% prevalence for the past 12 months' nonmedical use of the same classes of drugs, suggesting that the use of psychiatric medication without a prescription is not as common among Riyadh medical students comparing results presented here with Papazisis *et al.*^[21] who reported a prevalence rate of 10.7% for lifetime nonmedical use of psychiatric medications and 7.7% for past-year nonmedical use, and 62.8% of students who used prescription drugs nonmedically were clinical years students, while in our sample, 59% of those who used psychiatric medication nonmedically were clinical years students as well.

This also agrees with the study by James *et al.*^[22] who reported that students in senior years of medical college had more self-medication practices despite knowing the risks and

Table 3: College year and the count use of psychiatric medications

Academic Year		Medication Use		Total
		No, I have not	Yes	
Year*				
1 st Year	Count	149	18	167
	Standardized Residual	1.3	-2.7	
2 nd Year	Count	189	31	220
	Standardized Residual	1.0	-2.0	
3 rd Year	Count	182	54	236
	Standardized Residual	-0.6	1.1	
4 th Year	Count	267	72	339
	Standardized Residual	-0.3	0.6	
5 th Year	Count	190	55	245
	Standardized Residual	-0.5	1.0	
Internship year	Count	40	21	61
	Standardized Residual	-1.3	2.5	
Total	Count	1017	251	1268

*P<0.001 (Chi-square test)

Table 4: Correlation between GPA and use of psychiatric medications

Academic Performance		Medication Use		Total
		No, I have not	Yes	
GPA*				
>4.5	Count	532	93	625
	Standardized Residual	1.4	-2.7	
Between 4.5 and 4.0	Count	323	83	406
	Standardized Residual	-0.1	0.3	
Between 4.0 and 3.5	Count	126	52	178
	Standardized Residual	-1.4	2.8	
<3.5	Count	36	23	59
	Standardized Residual	-1.6	3.3	
Total	Count	1017	251	1268

*P<0.001 (Chi-square test)

discouraging others from doing, and one in every five college students uses psychiatric medications with prescription and the numbers have been increasing annually.^[22]

In our sample, the most commonly used psychiatric medication among medical users was antidepressants. This is explained by the increase in the prevalence of depression and psychological distress among medical students since a systematic review concluded that depression symptoms were estimated between 32% to 78% among Saudi Arabian medical students, while 106 (45.9%) students out of 231 students had anxiety, and 87 (37.7%) students had stress,^[23,24] being higher when compared with the general population, which may give rise to the development of illicit use of drugs and the decline in academic performance.^[9]

In our sample, opioids were the most used nonmedically, which is consistent with the previous studies.^[3,20]

Another study conducted among urban mid-Atlantic universities with 12,000 students reports that the most common type of

Table 5: Comparison of demographic profiles between prescription and nonprescription use

Variable	Prescription		P
	Yes	No	
Age			
18-20	39 (19%)	9 (21%)	0.772
21-23	129 (62%)	25 (57%)	0.491
24-26	35 (17%)	9 (21%)	0.601
Above 26	4 (2%)	1 (2%)	0.873
Gender			
Male	70 (34%)	29 (66%)	<0.001***
Female	137 (66%)	15 (34%)	<0.001***
Year			
1 st Year	14 (7%)	4 (9%)	-a
2 nd Year	28 (14%)	3 (7%)	0.230
3 rd Year	42 (21%)	12 (27%)	0.320
4 th Year	64 (30%)	8 (18%)	0.089
5 th Year	41 (20%)	14 (32%)	0.086
Internship year	18 (9%)	3 (7%)	0.701
GPA			
<2.5	3 (1%)	0 (0%)	-a
2.5-3.0	5 (2%)	1 (2%)	0.966
3.0-3.5	12 (6%)	2 (5%)	0.757
3.5-4.0	45 (21%)	7 (16%)	0.409
4.0-4.5	64 (31%)	19 (43%)	0.117
>4.5	78 (38%)	15 (34%)	0.618
University			
IMSIU	55 (27%)	15 (34%)	0.318
KSAUHS	61 (30%)	18 (41%)	0.139
KSU	37 (18%)	6 (14%)	0.477
Other	4 (2%)	2 (5%)	0.294
PNU	50 (24%)	3 (7%)	0.012*
Medication type			
Antianxiety medications	26 (12%)	13 (30%)	0.004
Antidepressants	137 (65%)	7 (16%)	< 0.001***
Neuroleptic medications	6 (3%)	0 (0%)	^a
Opioids or pain meds	38 (18%)	24 (55%)	<-0.001***

Notes: Within-variable percentages are displayed in parentheses, and absolute counts are shown in cells. n=207 for prescription group; n=44 for nonprescription group. Z-tests are computed with Bonferroni correction for comparisons within the same variable. a Group proportion is equal to 0, implying that it is impossible to calculate the test statistic. *Significant at the P<0.05 level; ***significant at the P<0.001 level

Table 6: Motives for nonmedical use of psychiatric medications

	Count	Column %
Motives		
Other	3	7.3%
To experiment to see what it is like	4	9.8%
To feel good or get high	3	7.3%
To get away from my problems or troubles	2	4.9%
To get through the day	6	14.6%
To get to sleep	2	4.9%
To relax or relieve tension	12	29.3%
To seek deeper insights and understanding	1	2.4%
To relieve pain	8	19.5%

prescribed psychiatric medication was opioids followed by CNS depressants.^[25]

Regarding the motivation to use psychiatric medications without a prescription from Riyadh's general population, 302 subjects, 128(42.4%) attributed their use that their “symptoms aren't serious“. followed by “High cost of psychiatric clinics” 86(28.5%).^[26] which differs from our sample where most common motives among medical students using psychiatric medication non-medically is to 'relax or relieve tension' (29%), followed by those who use them to 'relieve pain' caused by other health problems (20%), and to 'get through the day' (15%). These motives were similar to another result reported by Tam *et al.*,^[1] which motives of all prescription drugs and showed that the most common reported motive was pain relief (83.6% Beijing; 77.0% Macau). Results reported here, however, are somewhat different from those described by Teter *et al.*,^[27] where having better concentration and increased alertness were the top of the list of motives when compared with this present study.

The US Preventive Services Task Force recommends screening by asking questions about the nonmedical use of prescribed drugs (not including alcohol or tobacco) such as the type of medication, duration of use, and the motives for 18 years or older. Screening should be implemented when services for accurate diagnosis, effective treatment, and appropriate care can be offered or referred. The benefit of screening is the early intervention for Psychosocial programs and pharmacological intervention for abstinence for those who already use nonmedical prescription medications.^[28,29]

However, some early interventions to prevent the starting of nonmedical use of drugs were associated with reduced incidents, but the overall conclusion shows inconsistent results in USPSTF recommendations.^[30]

A nonpharmacological approach could also be promising in primary care settings for young adults' mental disorders such as anxiety and depression whether they under use illicit medications or not. Recent studies reported that in 1589 participants recruited from a multi-site primary care practice, 491 participants with anxiety participated in cognitive behavioral therapy (CBT) had decreased level of anxiety ($P < 0.001$, $d = 0.57-0.95$),^[2] and in 1302 participants with a primary depressive disorder, 435 endorsed moderate to severe depression engaged on CBT had decreased levels of depression as well ($P \leq 0.001$, $d = 0.52-0.78$).^[31]

Around 92% of primary care physicians in Saudi Arabia are willing to use CBT to patients if they have enough training, with half of them showing a positive perception to practice CBT to primary care patients.^[32]

Conclusion and Limitations

This study presents several important insights. One out of five medical students, out of total participants 1268, uses psychiatric medications whether it is under prescription or not, even though the prevalence of nonmedical use of psychiatric medications

in the population of medical students in Riyadh is several times lower than what was reported by other researchers (e.g., Papazisis *et al.*, 2017; Teter *et al.*, 2010). However, the need of early screening and preventive measures should be implemented as the recent guidelines of the US task force suggested, with specialized model in Saudi Arabia to approach such cases between primary health care providers and psychiatrists for the best service care to be delivered.

Students between the age of 24–26, females, those enrolled in clinical years of study, and those with lower GPAs are more likely to use psychiatric medications. University of origin did not play an important role here.

Several statistical models and tests suggest that males are more likely to engage in psychiatric medication use without a prescription.

However, these interpretations should be taken with care as they are based on a very small proportion of the sample that uses psychiatric medication nonmedically.

Future research in this area should focus on including more participants across different regions of Saudi Arabia in general to draw more conclusions from all segments of the population.

Declaration of patient consent

The authors certify that they have obtained all appropriate participant consent forms. In the form, the participants have given their consent for their images and other clinical information to be reported in the journal. The participants understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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