Original Article

Do Psychostimulants impact academic grades? A cross-sectional survey on medical students of Karachi, Pakistan

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Objective: To determine prevalence of use of psychostimulants among medical students in a private medical college in Karachi and to assess the association of their intake and other independent variables with the examination grades of the students.

Methodology: This cross-sectional survey was conducted from April to July, 2018, on 299 medical students from 1st to 4th year MBBS. A semi-structured, self-administered questionnaire was used. Purposive sampling technique was employed for recruitment of the students.

Results: Out of 299 students, 57.5% used psychostimulants, mostly for duration of 1-5 years. Caffeine was the most commonly used psychostimulants, followed by nicotine. Most of them used them to stay alert and aroused during their exams. Students studying in 3rd year were using psychostimulants more often compared to other years. We did not find any associations between psychostimulant use and their impact on students' grades. Increase in the student's age and being a female increased the marks of the students, with each year increase of year of education, there was a decrease in student's marks.

Conclusion: This study suggests the interplay of factors other than psychostimulants in the academic grades of medical students. As students grew older, their grades decreased, being a female increased marks more compared to being a male student. (Rawal Med J 202;45:479-482).

Keywords: Psychostimulant, medical students, academic grades, Pakistan.

INTRODUCTION

Becoming a medical professional requires a student to work and study for long hours under intense pressure of workload that can affect the health and academic grades of students.[1] As a result, they adopt various coping strategies that, decrease the level of stress in them, and also improve their academic performance and attention span.[2] For enhancing their performance, medical students use psychostimulants.[3,4]

Psychostimulants are defined as substances that function to stimulate the brain and increase its activity.[5] Caffeine, nicotine, methamphetamine, methylphenidate and cocaine are some examples of psychostimulants. Students may use them for various motives. A total of 1,718 French medical students and physicians were interviewed among whom, 33% were found to use one or more forms of psychostimulants and consumption was intended mainly at increasing their performance during academics, their concentration, memory, and wakefulness during preparation for their examinations.[6]

A study from Pakistan evaluated the use of Central Nervous System (CNS) stimulants among medical and non-medical students. In this cross sectional survey, 77.7% medical students and 70.5% non-medical students were using CNS stimulants without any prescription, which included nicotine, caffeine, cocaine, energy drinks, alcoholic beverages and *shisha* smoking.[7] There is not much literature available in Pakistan regarding this burning issue. This study was aimed at assessing the frequency of use of psychostimulants among medical students in a private medical college in Karachi, Pakistan. We also quantitatively assessed the association of intake of psychostimulants with the examination grades of the students.

METHODOLOGY

It was a cross-sectional survey conducted from April to July, 2018, on all Medical students from 1st to 4th year MBBS, at Liaquat National Medical College, Karachi, Pakistan. It is a private medical college. For this study, we used the grades of the students' recent module exams that they had given in the college. The study was approved by the Ethical

Review Board (ERB) of Liaquat National Medical College (LNMC), Karachi. A Written informed consent was taken from every student. Purposive sampling technique was employed and all males and females from 1st to 4th year MBBS were included in the study. The exclusion criteria comprised of students who did not give consent to participated in the study, who were not present at the time of data collection and those whose grades were not provided due to any administrative reason.

The data were collected by a senior student of Liaquat National Medical College. She had no access to the grades of the students, in order to maintain confidentiality. A self-administered questionnaire was used, taking 10-15 minutes for completion. They were distributed among students at the end of their lectures. Confidentiality of the students was assured by keeping their names optional. However, writing their roll numbers on the questionnaire provided to them was compulsory for assessment of grades. As the student completed and handed over the questionnaire, it was assessed for completion.

Statistical analysis: SPSS version 18 was used for data analysis. Chi Square test was run in order to assess the significance of difference of psychostimulant use among students and their associated demographic variables. A p=0.05 was taken as significant. We used Univariate linear regression analysis and Unadjusted odds ratios (ORs) and their 95% confidence intervals (CIs) were computed to see the association between the independent variables (age of the student and their gender, year of education, place of residence (i.e. home or hostel), use of a particular psychostimulant, duration of its use and motives behind the use), and dependent variables (examination grades of students). We included variables having a p-value < 0.25 and the variables having a biological plausibility in the multivariable regression model. Adjusted ORs with their CIs were obtained for different categories of independent variables.

RESULTS

The response rate was almost 90%. Out of 299 students, 87(29.1%) were male and 212(70.9%) female with mean age of 20.48±1.33 years. Majority of the students lived locally in the city (81.6%) compared to hostel dwellers (18.4%). Of the 299 students, 57.5% used psychostimulants, most of them using a psychostimulant for duration of 1-5 years (50.0%) (Table 1). Main motive of using a psychostimulants, was to stay alert and aroused during their exams (53.50%), followed by staying awake for studies (41.9%) (Fig.).

Table 2 shows the results of Chi Square test of significance. Female students were more likely to use psychostimulants compared to male students (59.4% vs. 52.9%, p=0.30), students who were hostel dwellers used psychostimulants more often compared to students living at homes (63.6% vs. 56.1%, p=0.36) (Table 2).

Table 1. Demographic and Psychostimulant-related characteristics (n=299).

Variable	Study subjects	(%)
Age (years)		
Mean (SD)	20.50 (1.33)	-
Sex		
Male	87	29.1
Female	212	70.9
Place of residence		
Home	244	81.6
Hostel	55	18.4
Use of Psychostimulant		
Yes	172	57.5
No	127	42.5
Duration since using Psychostimulant		
< 1 year	7	4.1
1-5 years	86	50.0
6-10 years	26	15.1
>10 years	3	1.7
Don't remember	49	28.5
Only during exams	1	0.6
Frequency of type of psychostimulants used by Medical students		
Caffeine (Tea/coffee)		86
Tobacco		2.9
Energy drinks		2.3
Theophylline		1.1
Chili		0.6
Others*		7.0
Educational level since first consumption of psychostimulant		
Before starting Medical college	116	67.4
After starting Medical studies	56	32.6

Others*: Combination of psychostimulants

Table 2. Frequency of psychostimulant use and the associated demographic variables.

	Psychostimulant use		
Demographic variables	**Yes**	**No**	**p-value**
Gender			
Male	52.9%	47.1%	
Female	59.4%	40.6%	0.30
Place of residence			
At home	56.1%	43.9%	0.36
In hostel	63.6%	36.4%	
Year of education			
1st year	41.8%	58.2%	
2nd year	62.7%	37.3%	0.02*
3rd year	65.4%	34.6%	
4th year	57.9%	42.1%	
Age (categories)			
17-20	54.0%	46.0%	
21-24	61.1%	38.9%	0.24

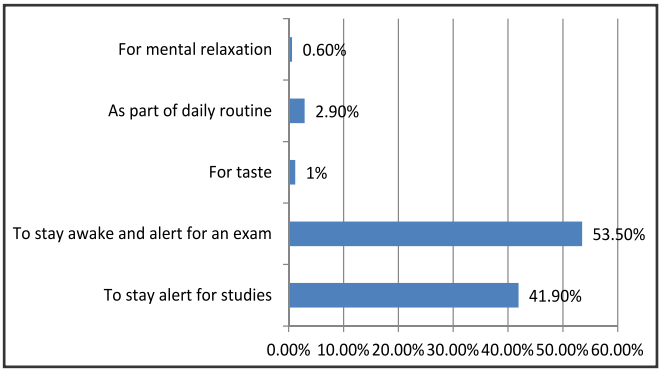
*p<0.05 **p<0.01 ***p<0.001

Table 3. Linear Regression analysis for predictors of academic grades.

Variables	Unadjusted	Adjusted
Age of students (in years)	-9.51 (-12.0 - -6.9)***	-3.38 (-7.3 - 0.5)
Gender		
Male	1.00	1.00
Female	21.73 (14.0 - 29.4)***	19.85 (12.6 - 27.0)***
Place of residence		
Hostel	1.00	1.00
Home	11.03 (1.6 - 20.4)*	-0.41 (-9.2 - 8.3)
Year of education	-11.67 (-14.7 - -8.6)***	-8.34 (-13.3 - -3.3)***
Use of psychostimulants	-0.78 (-8.2 - 6.6)	-2.06 (-8.5 - 4.4)

*p<0.05 **p<0.01 ***p<0.001

Fig. Motives of students for using psychostimulants (n=175).



Using linear regression analysis, we found no association of psychostimulant use and exam grades on both univariate as well as multivariate analysis. On univariate linear regression analysis, we found strong associations between the outcome variable: student academic grades and the predictor variables like increasing age, female gender, students living at home and earlier years of education. On multivariate regression analysis, there was an increase in grades to 3 marks with each year increase in the student's age (Table 3). Being a female increased the grades to around 19.8 marks compared to being a male student. With each year increase of the year of education, there was a decrease in grades up to 8.3 marks (p=0.01).

DISCUSSION

The most commonly used psychostimulant by the medical students was caffeine, being easily available in the households and in cafeteria. Other psychostimulants like tobacco, energy drinks, theophylline, cannabis etc. were used, however, less, compared to caffeine. The possible explanation of this pattern may be due to the taboos associated with the consumption of such products in a country like Pakistan, owing to the cultural and societal norms.[8]

Similar results were seen in a study conducted by Fond et al[4] among French undergraduate medical students and postgraduate doctors. Over The Counter drugs (OTC= Caffeine tablets/ energy drinks containing high dosage of caffeine) were consumed by 29.7% students. The least consumed drugs were cocaine and amphetamine (5.2%).

Previous researchers have observed a decline in academic grades with increased psychostimulant use,[9] our findings were similar, however, being insignificant. This is important information, since many students rely on psychostimulants during long studying hours, with the motive of increased wakefulness and alertness.[10,11] This also points to the fact that not all psychostimulants could be responsible for the better performance of student grades, and that, there is an interplay of various other factors, besides just their use.[12]

Most students were seen to have higher consumption of psychostimulants when in their 3rd year of medical education and this difference was significant compared to other academic years. This

is a crucial year academically, where students have to study theory as well as clinical sciences. Also, they have to study more advanced subjects like Pathology, Microbiology, Pharmacology, Forensic Medicine etc. which are far difficult from what they have been used to studying in the previous two years.

We had some limitations in the study. The most important being respondent bias, as a result of documenting the class roll numbers of the students, which may have led to an understatement of the use of psychostimulant, particularly the ones with a stigma attached to their use. The fear of judgment could have been the reason for not documenting some important information. We did not assess the quality of sleep. Sleep disorder itself is an extensive topic to be researched and it comprises of many disorders like apnea, obstructive sleep apnea, etc, requiring further detailed questions.

CONCLUSION

This study suggests the impact of various factors apart from psychostimulants in the achievement of academic grades of medical students. Further studies directed as other factors associated with the social and mental health aspects of student life is suggestive in order to further explore into the academic performance of medical students.

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