

Research Article

**Prevalence of benzodiazepine harmful use in medical student
of Nishter Medical College Multan**

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ABSTRACT

Objective: To determine prevalence of benzodiazepine harmful use among medical students of Nishter Medical College Multan.”

Materials & Methods: A total of 250 medical students of Nishter Medical College Multan of age 18-25 years of either gender were included. Students with history of mood disorders, psychotic disorders, anxiety disorders and personality disorders, any chronic physical illness were excluded. After taking informed consent, each student was given the proforma to fill by themselves and assess by single psychiatrist for benzodiazepine harmful use.

Results: Mean age was 22.51 ± 2.19 years. Majority of the students 192 (76.80%) were >21 years of age. Out of the 250 students, 189 (75.60%) were male and 61 (24.40%) were females with male to female ratio of 3.1:1. Benzodiazepine harmful use was found in 19 (7.60%) students.

Conclusion:

So, on the whole it was concluded that prevalence of benzodiazepine harmful use among medical students of Nishter Medical college is 7.60% which is little bit high.

Keywords: Benzodiazepine, addiction, medical, students.

INTRODUCTION

Benzodiazepines are widely prescribed, with four of them—alprazolam (Xanax), clonazepam (Klonopin), diazepam (Valium) and lorazepam (Ativan)—listed among the top 100 most commonly prescribed medications.¹ Benzodiazepines generally produce almost immediate effects, and thus may be prescribed for short-term, intermittent, “as-needed” use. Because many of the anxiety disorders wax and wane over time, patients with these disorders often prefer benzodiazepines because these agents can be taken intermittently, when patients feel the need to take them, and most patients can use benzodiazepines judiciously.²

Benzodiazepines are also widely prescribed for other reasons, such as muscle spasticity, convulsive disorders, presurgical sedation, involuntary movement disorders, detoxification from alcohol and other substances, and anxiety associated with cardiovascular or gastrointestinal conditions.³ According to the APA report on benzodiazepines,² 11 to 15 percent of the adult population has taken a benzodiazepine one or more times during the preceding year, but only 1 to 2 percent have taken benzodiazepines daily for 12 months or longer. In psychiatric treatment settings and in substance-abuse populations, however, the prevalence of benzodiazepine use,

abuse and dependence is substantially higher than that in the general population.^{4,5}

Because benzodiazepines are controlled substances with abuse potential, special attention must be directed toward the patient's addiction history before these agents are prescribed. An understanding of the toxicity and side effects of benzodiazepines, abuse patterns and alternative anxiolytic and hypnotic agents may help clinicians maximize treatment outcomes and reduce medicolegal liability risks. As potential drugs of abuse, short-acting benzodiazepines seem to be preferred among addicts because of the rapidity of their onset of action.⁶

In general, mood-altering substances are most highly reinforcing in patients with chemical dependence if the agent has a rapid onset of action, a high potency, a brief duration of action, high purity and water solubility (for intravenous use) or high volatility (ability to vaporize if smoked).⁷ Data suggest that highly lipophilic benzodiazepines (for example, those that cross the blood-brain barrier more rapidly), such as diazepam, and agents with a short half-life and high potency, such as lorazepam or alprazolam, are the most reinforcing benzodiazepines and, therefore, the ones most likely to be associated with abuse.⁶

Health professionals, including medical students are said to be at a higher risk of substance harmful use because of relatively easy access to the drugs, high levels of work related stress, frequent contact with illness and death, relative isolation of medical school and disrupted sleep and social life. A study carried out in Pakistan regarding the prevalence and pattern of substance harmful use among the medical students in Lahore shows that illicit substance harmful use among the medical students is unacceptably high 17% and it may threaten their ability to provide adequate patient care and be a role model for healthy lifestyle.⁸ Medical College is considered to be a time of significant psychological distress for physicians in training. Some aspects of training may have unintended negative effects on medical students mental and emotional health.⁹

Medical students, as tomorrow's doctors, hold a unique place in society and have privileges and responsibilities different from those of other students. Different standards of professional behavior are hence expected of them.¹⁰ Substance use by medical student's poses risks to them and can also have serious consequences on their effectiveness and fitness to practice as tomorrow's doctors. It is believed that substance use among physicians starts early in their careers¹¹⁻¹³ and the importance of studying the lifestyles of medical students to detect substance abuse is well recognized.^{10,11,14,15}

Benzodiazepine is the only substance found to be harmfully used by both male and female students as an anxiolytic especially during examination period.¹⁶ According to another study, the prevalence of harmful use of benzodiazepines among medical students was found 6%.⁹ A cross sectional study of medical students at Agha Khan University, found that a large majority of medical students were tolerant towards self-prescription of benzodiazepine for short term use.¹⁷ Benzodiazepines are notorious universally and particularly in our country for their dependence and high frequency of use for deliberate self-harm.¹⁸

The leading reasons deemed justifiable for students taking up drugs, peer pressure (96%), academic stress (90%), curiosity for experimentation and "to get high" (88% each), insomnia (34%).¹⁹ The most common sources of stress according to a study conducted in Nepal were staying at a hostel, high parental expectations and a vastness of syllabus and tests/exams, whereas another study conducted in Pakistan found different stress factors such as family history of depression (28.9%).⁹

Rationale to conduct this study was to evaluate the prevalence of harmful use of benzodiazepine among the medical students because benzodiazepines have widespread acceptability as relatively benign sleeping pills and in past no such study had been conducted. It would ultimately help policy makers to start campaigns regarding awareness among medical students about the

discouragement of such activity which would be helpful for them in future.

OPERATIONAL DEFINITIONS:

1. Medical student: Under graduate students from 1st professional MBBS to final professional MBBS of Nishter Medical college.
2. Benzodiazepines: A class of drugs that have a hypnotic and sedative action, used mainly as tranquilizers to control symptoms of anxiety.
3. Harmful use: Harmful use of a drug was considered if a person had taken any drug of benzodiazepines group in any dose, without physician's advice within last month for once or more than once.

Study design:

Descriptive, Cross Sectional study.

Setting: Nishter Medical College Multan

Duration of study: January 2016 to June 2016

Inclusion Criteria:

1. Medical students of Nishter Medical College Multan.
2. Gender: both male and female.
3. Age: 18-25 years.

Exclusion Criteria:

1. Medical students with history of mood disorders, psychotic disorders, anxiety disorders and personality disorders.
2. Medical students with history of any chronic physical illness.
3. Medical students not willing to participate in study.

Data collection procedure:

After permission from the ethical review committee, 250 medical students, after taking informed consent, were given the proforma to fill by themselves and assess by single psychiatrist for benzodiazepine harmful use. The proforma comprised of two parts, first part comprised of

demographic variables i.e. age, gender and MBBS class while second part consisted of study variables i.e. residing in hostel or at home, monthly family income, belongs to urban or rural community, taken benzodiazepines within last month and frequency of intake was noted in predesigned proforma.

Data analysis procedure:

All the data collected through proforma was entered and analyzed with SPSS version 17. The qualitative data like gender and benzodiazepine harmful use was presented as frequency and percentages. Quantitative data like age (years) was presented as means \pm standard deviations. Effect modifiers like age, gender, locality, monthly income were dealt by stratification. All the results were presented in the form of tables and graphs. Chi square test was applied to see any statistical difference between groups if existed. P value of ≤ 0.05 was taken as significant.

RESULTS

Age range in this study was from 18 to 25 years with mean age of 22.51 ± 2.19 years. Majority of the students 192 (76.80%) were >21 years of age as shown in Table III. Out of the 250 students, 189 (75.60%) were male and 61 (24.40%) were females with male to female ratio of 3.1:1 (Figure 1). The %age of patients according to monthly income and locality are shown in Figure 2&3 respectively.

Benzodiazepine harmful use was found in 19 (7.60%) students as shown in Figure 4. When Stratification was done on age groups and gender, it was found that there was no statistically significant difference of benzodiazepine harmful use between different age groups and gender as shown in Table IV & V respectively. Table VI & VII have shown the stratification of benzodiazepine harmful use with respect to monthly income and locality respectively and found statistically no significant difference among them.

Table-1: Age distribution (n=250)

Age (years)	No. of patients	% age
18-20	58	23.20
>20-23	94	37.60
>23-25	98	39.20
Total	250	100.0

Figure-1: %age of students according to gender (n=250).

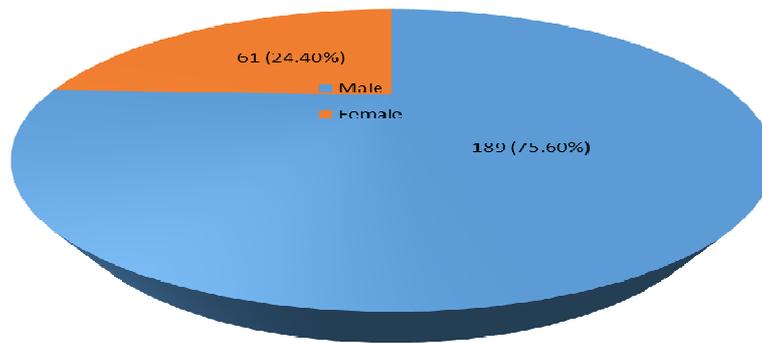


Figure 2: %age of students according to monthly income.

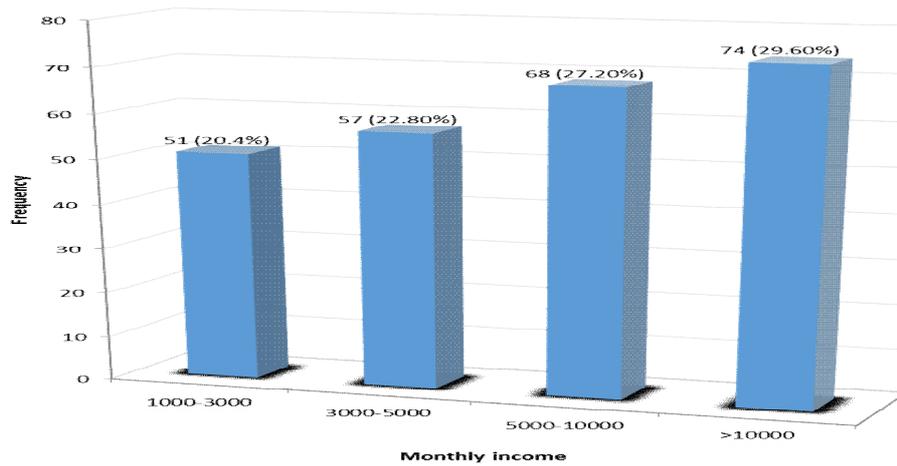


Figure 3: %age of students according to Locality.

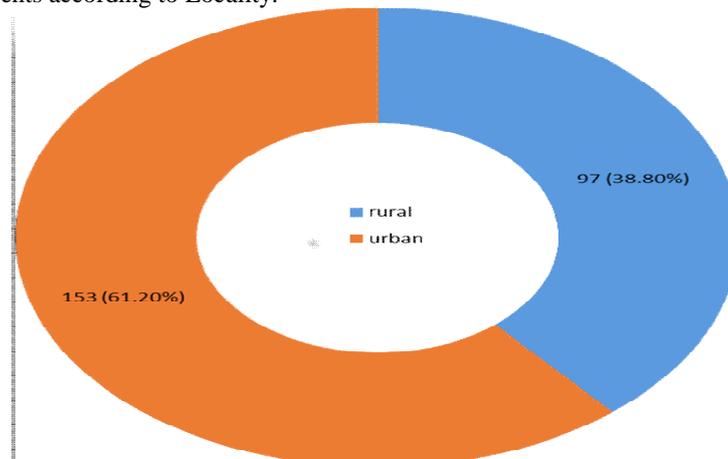


Figure 4: %age of students with Benzodiazepine harmful use.

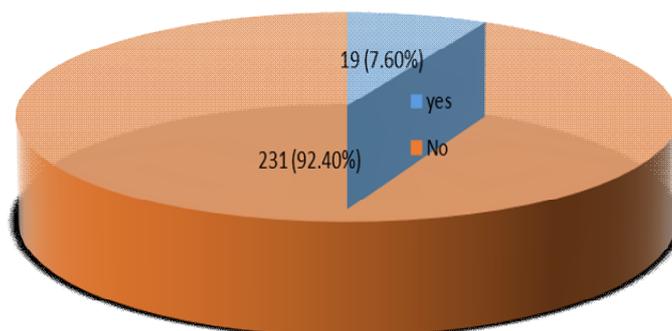


Table 2: Stratification of Benzodiazepine harmful use with respect to age groups.

Age (years)	Benzodiazepine harmful use		p-value
	Yes	No	
18-20	01 (1.72%)	57 (98.28%)	0.142
>20-23	08 (8.51%)	86 (91.49%)	
>23-25	10 (10.20%)	88 (89.80%)	

Table 3: Stratification of Benzodiazepine harmful use with respect to Gender.

Gender	Benzodiazepine harmful use		p-value
	Yes	No	
Male	16 (8.47%)	173 (91.53%)	0.363
Female	03 (4.92%)	58 (95.08%)	

Table 4: Stratification of Benzodiazepine harmful use with respect to monthly income.

Monthly Income	Benzodiazepine harmful use		p-value
	Yes	No	
1000-3000	02 (3.92%)	49 (96.08%)	0.110
>3000-5000	02 (3.51%)	55 (96.49%)	
>5000-10000	05 (7.35%)	63 (92.65%)	
>10000	10 (13.51%)	64 (86.49%)	

Table 5: Stratification of Benzodiazepine harmful use with respect to locality

Locality	Benzodiazepine harmful use		p-value
	Yes	No	
Rural	05 (5.15%)	92 (94.85%)	0.268
Urban	14 (8.92%)	143 (91.08%)	

DISCUSSION

Benzodiazepines are a group of drugs called minor tranquilizers, often known as benzos. These drugs are prescribed by a doctor to help people with anxiety or sleep problems. There are about 30 different types (generic names) of benzodiazepines. Each one of these generic name drugs may be sold under several different brand names – all the same drug, but made by different companies.¹⁹ Benzodiazepines slow down the

workings of the brain and the central nervous system. They are used medically to reduce anxiety, to help people sleep and to relax the body. They should only be prescribed for short periods of time. This is because it is possible to become dependent on them after as little as four weeks' use as directed by a doctor.¹⁹⁻²⁰

The growing non-medical use of prescription drugs is a global health concern. Such usage can be defined as the taking of prescription drugs, whether obtained by prescription or otherwise,

other than in the manner or for the reasons or time period prescribed, or by a person for whom the drug was not prescribed. The real scale of the problem is unknown, due partly to lack of data on the non-medical use of prescription drugs, and partly to the existence of many gaps in the monitoring of their legal use for medical purposes as prescribed by health-care professionals (which creates opportunities for the diversion of these drugs to people to whom they were not prescribed). Most studies on and monitoring instruments for substance abuse pertain to the use of illegal drugs, or alcohol and tobacco. However, the non-medical use of prescription drugs is a unique category of substance use in number of ways and requires attention at different levels.^{21,22}

In recent years, the problem of non-medical use of psychoactive drugs by medical students and physicians has become an area of growing interest and concern for researchers, educational institutions and medical associations.²³⁻

²⁴ Physicians themselves can be seen as occupying diametrically opposite, and at times conflicting positions in relation to substance misuse; on the one hand they have a higher prevalence of drug misuse, but on the other they also have a pivotal role to play in the early detection of drug misuse, including among colleagues, and referral to appropriate services.²³⁻²⁴ We have conducted this study to determine the prevalence of benzodiazepine harmful use among medical students of Nishter Medical college.

In our study, benzodiazepine harmful use was found in 19 (7.60%) students. According to a study, the prevalence of harmful use of benzodiazepines among medical students was found 6%.⁹ A cross sectional study of medical students at Agha Khan University, found that a large majority of medical students were tolerant towards self-prescription of benzodiazepine for short term use.¹⁷ Studies from the UK and Ireland report 14%–35.6% current illicit substance use and up to 90% current alcohol use,^{106,107} which is far higher than our findings and those of other studies from the subcontinent.²⁵⁻²⁶

Magalhaes et al²⁷ in 1991 has done a study on 1,069 university students from various faculties in the city of São Paulo and found prevalence of benzodiazepine harmful use in 5.0% students. Mesquita et al¹¹¹ in 1995 in the same institute has found this prevalence in 11.0% students. Female sex was found to be a protective factor against the use of benzodiazepine harmful use even after adjusting for age, year of study, and tobacco, alcohol and non-prescription drugs.²⁵ Western studies report a much narrower gender gap among substance users¹⁵ and note rising rates of substance use by women.¹⁵ There is also clear evidence now of greater medical, physiological and psychological harm occurring earlier in women who start using alcohol excessively.²⁸

The problems arising from substance use among medical students and its correlates have been described in various studies. Substance use among doctors is a personal health risk and could lead to serious professional consequences including negligent behaviour, impaired fitness to practice and even serious harm to patients. Physicians who misuse addictive substances may also fail to take the issue seriously when confronted by such problems in their patients.²⁵

There are many reasons for the drug use among medical college students. Among them the need to reduce stress related to high academic and social demands,²⁹ curiosity, the pursuit of pleasure; the need for more study time and to make friends,³⁰ to increase the concentration and energy levels to improve the academic performance, recreation³¹ and to suppress the appetite. Furthermore, students in the health field may have greater access to psychiatric drugs.²⁹ Moore et al. identified several medical school precursors of physician drug abuse including lack of religious affiliation, smoking a pack of cigarettes a day, regular use of alcohol, anxiety or anger as a response to stress, and frequent use of alcohol in non-social settings. Idealistic behaviors, high academic rank in class, perfectionist behavior—traits that are likely to predict success in medical school—have been

described as risk factors for substance use.³²⁻³³ So, on the whole it is concluded that prevalence of benzodiazepine harmful use among medical students of Nishter Medical college is 7.60% which is little bit high.

CONCLUSION

This study concluded that prevalence of benzodiazepine harmful use among medical students of Nishter Medical College Multan is 7.60% which is little bit high. So, we recommend that there should be campaigns regarding awareness among medical students about the discouragement of such activity which would be helpful for them in future.

REFERENCES

1. American Druggist. Top 200 drugs of 1995. New York, N.Y.: Hearst Corp, 1996:18–26.
2. Salzman C, for Task Force on Benzodiazepine Dependency, American Psychiatric Association. Benzodiazepine dependence, toxicity, and abuse: a task force report of the American Psychiatric Association. Washington, D.C.: American Psychiatric Association, 1990.
3. Hollister LE, Muller-Oerlinghausen B, Rickels K, Shader RI. Clinical uses of benzodiazepines. *J Clin Psychopharmacol*. 1993;13(suppl 1):1S–169S.
4. Ciraulo DA, Sands BF, Shader RI. Critical review of liability for benzodiazepine abuse among alcoholics. *Am J Psychiatry*. 1988;145:1501–6.
5. Busto UE, Romach MK, Sellers EM. Multiple drug use and psychiatric comorbidity in patients admitted to the hospital with severe benzodiazepine dependence. *J Clin Psychopharmacol*. 1996;16:51–7.
6. Roache JD, Meisch RA. Findings from self-administration research on the addiction potential of benzodiazepines. *Psychiatric Annals*. 1995;25(3):153–7.
7. Parran TV. Prescription drug abuse. A question of balance. *Med Clin North Am*. 1997;81:967–78.
8. Imran N, Haider IJ, Bhatti MR, Sohail A, Zafar M. Prevalence of Psychoactive Drug Use among Medical Students in Lahore. *ANNALS*. 2011;10:343–46.
9. Alvi T, Assad F, Ramzan M, Khan FA. Depression, Anxiety and Their Associated Factors Among Medical Students. *J Coll Physicians Surg Pak*. 2010;20(2):122–26.
10. Medical Schools Council, General Medical Council. Medical students: Professional behaviour and fitness to practice, 2007. Available at http://www.gmc-uk.org/education/documents/Medical_students_Professional_behaviour_and_fitness_to_practice.pdf (accessed on 12 December 2007).
11. Moore RD, Mead L, Pearson TA. Youthful precursors of alcohol abuse in physicians. *Am J Med*. 1990;88:332–6.
12. Murray RM. Characteristics and prognosis of alcoholic doctors. *Br Med J*. 1976;2:1537–9.
13. Baldisseri MR. Impaired healthcare professional. *Crit Care Med* 2007;35:S106–S116.
14. Akvardar Y, Demiral Y, Ergor G, Ergor A. Substance use among medical students and physicians in a medical school in Turkey. *Soc Psychiatry Psychiatr Epidemiol* 2004;39:502–6.
15. Boland M, Fitzpatrick P, Scallan E, Daly L, Herity B, Horgan J, et al. Trends in medical student use of tobacco, alcohol and drugs in an Irish university, 1973–2002. *Drug Alcohol Depend*. 2006;85:123–8.

16. Khanal P, Ghimire RH, Gautam B, DhuganaSk, Parajuli P, JaiswalAk, et al. Substance Use among Medical Students in Kathmandu Valley. *J Nepal Med Assoc.* 2010;49(180):267-72.
17. Naqvi H, Hussan S, Dossa D. Benzodiazepine: slow sand of Addiction. *J Pak Med Assoc.* 2009;59(6):415-17.
18. Khan SA, Farooq S, Bano A. Pattern of Benzodiazepine Use in Nurses. *Gomal J Med Sci.* 2011;9(1):28-31.
19. Stevens JC, Pollack MH. Benzodiazepines in clinical practice: consideration of their long-term use and alternative agents". *J ClinPsychiatr.* 2005;66(Suppl 2):21-7.
20. Work Group on Panic Disorder. "APA Practice Guideline for the Treatment of Patients With Panic Disorder, Second Edition". Retrieved July 12, 2009.
21. Panico R, Powell WH, Richer JC, eds. A Guide to IUPAC Nomenclature of Organic Compounds. IUPAC/Blackwell Science. pp. 40-3. ISBN 0-632-03488-2.; Moss GP (1998). "Nomenclature of fused and bridged fused ring systems (IUPAC Recommendations 1998)" (PDF). *Pure Appl Chem.* 1993;70(1):143-216.
22. Ripka WC, De Lucca GV, Bach AC, Pottorf RS, Blaney JM. "Protein β -turn mimetics I. Design, synthesis, and evaluation in model cyclic peptides". *Tetrahedron.* 1993;49(17):3593.
23. Clark DC, Eckenfels EJ, Daugherty, SR, Fawcett J. Alcohol-use pattern through medical school. *JAMA.* 1987;257:2921-6.
24. Clark DC, Daugherty, SR, Baldwin Jr DC, Hughes PH, StorrCL, Hedeker D. Assessment of drug involvement: Applications to a sample-of physicians in training. *B J Add.* 1992;87:1649-62.
25. Kumar P, Basu D. Substance abuse by medical students and doctors. *J Indian Med Assoc.* 2000;98:447-52.
26. Naskar NN, Bhattacharya SK. A study on drug abuse among the undergraduate medical students in Calcutta. *J Indian Med Assoc.* 1999;97:20-1.
27. Magalhães MP, Barros RS, Silva MTA. Uso de drogas entre universitários: A experiência com maconhacomofatordelimitante. *Rev ABP-APAL* 1991;13(3):97-104.
28. Brady KT, Randall CL. Gender differences in substance use disorders. *PsychiatrClin North Am.* 1999;22:241-52.
29. Romero MI, Santander J, Hirschfeld MJ, Labbé M, Zamora V. Consumo de sustanciasilícitas y psicotrópicos entre los estudiantes de Medicina de la Pontificia Universidad Católica de Chile. *Rev Med Chile.* 2009;137(4):59-65.
30. Urrego MA, Orozco LA, Montoya LB, Soto LB, Velazquez DVC, Castrillon JJC, et al. Consumo de anfetaminas, para mejorar el rendimientoacadémico, en estudiantes de la Universidad de Manizales. *Arch Med.* 2008;9(1):43-57.
31. Buchanan JC, Pillon SC. Drug consumption by medical students in tegucigalpa, Honduras. *Rev. Latino-Am. Enfermagem.* 2008;16(n. espec):595-600.
32. Baldisseri MR. Impaired healthcare professional. *Crit Care Med* 2007;35:S106-S116.
33. Bissell L, Jones RW. The alcoholic physician: A survey. *Am J Psychiatry.* 1976;133:1142-6.