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Original Research Article

Prevalence of Self-Medication of Psychoactive Stimulants and Antidepressants among Undergraduate Pharmacy Students in Twelve Pakistani Cities

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Abstract

Purpose: To evaluate the prevalence of self-medication of psychoactive stimulants and antidepressants among pharmacy students of Pakistan.

Methods: A cross-sectional survey on self-medication of psychoactive stimulants and antidepressants among pharmacy students was conducted with a structured and validated questionnaire distributed to a total of 2981 final year undergraduate pharmacy students in 12 major Pakistani cities (Karachi, Lahore, Islamabad, Rawalpindi, Sargodha, Dera Ismail Khan, Abbottabad, Bahawalpur, Hyderabad, Faisalabad, Multan and Peshawar) of Pakistan. Out of this, 2516 (718 male and 1798 female) students completed and returned the questionnaire.

Results: Prevalence of self-medication of psychoactive stimulants was 1.31 (1.13 – 1.75 for 95% CI) and antidepressants was 8.34 (8.03 – 8.85 for 95% CI). A majority of the students (63 %) identified academic competition as a driving force for indulging in self-medication of psychoactive stimulants while nearly all the students (96 %) admitted using antidepressants to obtain relief from the pressure of studies ($p < 0.05$).

Conclusion: Pakistani pharmacy students, despite being aware of the hazards of psychoactive stimulants, indulge in self-medication. Prevalence of self-medication with antidepressants is very high among the students due to the pressure of studies. Primarily, academic competition is the major driving force for the use of psychoactive stimulants.

Keywords: Self-medication, Psychoactive stimulants, Antidepressants, Pharmacy students, Academic pressure

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INTRODUCTION

The term self-medication is defined as using non-prescription medications, without professional assistance, by patients according to their own knowledge and understanding [1]. Self-medication becomes a cause of concern when it is carried out on prescription drugs or in an irresponsible way. The potential consequences

of irresponsible self medication can lead to polypharmacy [2]. Self-medication occurs due to a number of reasons, such as ease of access, unwillingness to see the doctor, availability of leftover prescription medications of a friend or relative and in some cases, availability of prescription drugs over the counter [3]. In Pakistan, few studies have addressed the high prevalence of self-medications among students

[3-5]. The standard of community pharmacies in Pakistan is poor [6] and the knowledge of pharmacy dispensers is inadequate [7,8].

The reasons for irresponsible self medication, for most part, are related to pressure of academic studies, with students taking psychoactive stimulants so they can accomplish their tasks [9]. Furthermore, students may also use antidepressants to avoid the depressive behavior they might experience while coping up with their studies [10].

Pharmacists are considered health care providers that understand the consequences of irresponsible self-medication better than any other healthcare professional [11,12]. It is expected that undergraduate pharmacy students would have good knowledge of the health implications of self-medication compared to other university students. Therefore, we conducted a cross-sectional survey to assess the level of self-medication among the students.

EXPERIMENTAL

A quantitative cross sectional survey was conducted between February and October 2013 among final year students of pharmacy institutions of 12 major cities (Karachi, Lahore, Islamabad, Rawalpindi, Sargodha, Dera Ismail Khan, Abbottabad, Bahawalpur, Hyderabad, Faisalabad, Multan and Peshawar) of Pakistan. A total of 2516 volunteer participants were interviewed using a structured questionnaire prepared in English and Urdu.

Validation of research instrument and piloting

A structured questionnaire in English and Urdu language was formulated and was tested by a panel of experts including professors, psychotherapist, pharmacists and doctors. It was also piloted prior to initiation of the study.

Ethical approval and informed consent

Prior to the initiation of the data collection, the questionnaire was validated and ethical approval was obtained from the institutional review boards of various universities across Pakistan. The students were also explained about the data collection and its implication and consent was obtained before the administration of the questionnaire.

Target population

The target population comprised of the undergraduate final year pharmacy students

studying in all the education institutions of Pakistan (N = ~4465) [13]. However, we could not cover the cities of Quetta, Havelian, Kohat, Mirpur (AJK), Sialkot, Mardan and Sawabi in the study due to various security and travelling constraints. In this study 2981 students studying in public and private sector pharmacy awarding institutions in Karachi, Lahore, Islamabad, Rawalpindi, Sargodha, Dera Ismail Khan, Abbottabad, Bahawalpur, Hyderabad, Faisalabad, Multan and Peshawar were administered questionnaires and 2516 filled questionnaires were returned giving a response rate of 84.4 %. 230 questionnaires were left out due to incomplete/incorrect filling and 42 did not meet the inclusion and exclusion criteria. The remaining 2516 questionnaires were documented and analyzed. A majority of the participants (62 %, N = 1560) belonged to public sector universities while the remaining students were from private universities (38 %, N = 956).

Inclusion criteria

All the students of final year of professional pharmacy degree program (Pharm. D) were included in this study.

Exclusion criteria

All the students in the 1st to 4th year of their professional pharmacy degree along with incompletely filled questionnaire were excluded from the study.

Statistical analysis

Data analysis was carried out using SPSS v20 (Statistical Package for Social Science, version 20) and MedCalc (MedCalc Softwares Inc., Belgium). The prevalence rate was calculated. Chi squared test was used to determine association between categorical variables. Statistical significance was accepted at $p < 0.05$.

Conceptual framework

The study hypothesized (Ho) that pharmacy students are best aware of the untoward effects of irresponsible self-medication of psychoactive stimulants and antidepressants and do refrain from such activity.

RESULTS

There were more females than males in both public (73 %; N = 1139) and private universities (69 %; N = 659). The male students constituted about a third (27 %; N = 421) of the public universities students in the study and about a

little more males than that (31 %; N = 297) were constituting all the private universities participants.

Practice of self medication

When the students were asked about the hazards of irresponsible self medication, almost all (98 %) were aware of the negative outcomes and risk associated with it. It was further observed that despite this fact, a sizeable number of the students (N = 210) had a prevalence of 8.34 (8.03 – 8.85 for 95% CI) to be indulged in self-medication of anti depressants. A small proportion of students (N = 33) however was observed to be indulged in psychoactive stimulant use with a prevalence of 1.31 (1.13 – 1.75 for 95% CI).

In case of public sector universities which constitute 62 % (N = 1560; 421 males; 1139 females) of all the participants, the use of psychoactive stimulants was rare as only 5 female (0.43 % of all public sector females) and 1 (0.23 % of all males in public sector) male students acknowledge this habit. On the contrary, the use of anti-depressant was relatively more prevalent since 72 male students (17 % of all males at public sector) and 68 female students (6 % of all females at public universities) admitted the use of anti-depressants. Moreover, it was also observed that

the students of private sector universities which accounted for 38 % of the total included in study; out of the total 659 female students, 26 (3.94 % of total females in private) students were observed to be indulged in self medication of psychoactive stimulants while out of all 297, only 1 (0.33 % of all males in private) male student was reported to follow this practice. However in case of anti-depressants, 24 male students (8 % of all males in private) (7 %, N = 463) and 46 female students (~ 7 % of all females at private universities) were observed as indulged (Table 2).

When inquired about the reason for indulging in self medication of psychoactive stimulants, the majority (N = 21) of students (63 % of all users of psychoactive stimulants,) highlighted academic competition and pointed out performance enhancement as their sole reason for the use. Two students mentioned weight loss as the reason for their habit of drug use and few (N = 10, 30.3 %) used for other reasons, however, their first priority was also performance enhancement. In case of anti-depressants, nearly all (N = 201) of the anti-depressants using students (96 % of all antidepressant users) used them to relax themselves from the burden of the studies.

Table 1: Prevalence of self medication with psychoactive stimulants and anti depressants

Attribute	% (N)	95 % CI
<i>Prevalence of self medication of psychoactive stimulants</i>		
Public Universities		
Male students	0.23 (1)	
Female students	0.43 (5)	
Cumulative	0.38 (6)	
Private Universities		
Male students	0.33 (1)	
Female students	3.94 (26)	
Cumulative	2.82 (27)	
Cumulative prevalence	1.31 (33)	1.13 - 1.75
Sensitivity	90.63	84.25 - 93.65
Specificity	98.71	98.41 - 99.08
<i>Prevalence of self medication with anti depressants</i>		
Public Universities		
Male students	17 (72)	
Female students	6 (68)	
Cumulative	8.97 (140)	
Private Universities		
Male students	8.1 (24)	
Female students	7.02 (46)	
Cumulative	7.32 (70)	
Cumulative prevalence	8.34 (210)	8.03 - 8.85
Sensitivity	92.96	91.68 - 94.07
Specificity	96.14	94.98 - 96.16

Table 2: Cross tabulation of student demographics with self medication information

Attributes	Self Medication						
	Psychoactive Stimulants			Antidepressants			
Students of public sector universities							
Gender	Observed (N)	Total (N)	Observed (% of Total)	Observed (N)	Observed (% of Total)	Observed (N)	Observed (% of Total)
Male	421	2516	16.73	1	0.04	72	2.86
Female	1139	2516	45.27	5	0.20	68	2.70
Cumulative	1560	2516	62.00	6	0.24	140	5.56
Students of private sector universities							
Male	297	2516	11.80	1	0.04	24	0.95
Female	659	2516	26.19	26	1.03	46	1.82
Cumulative	956	2516	38.00	27	1.07	70	2.77
Cumulative students of all universities							
Male	718	2516	28.53	2	0.08	96	3.81
Female	1798	2516	71.46	31	1.23	114	4.52
Cumulative	2516	2516	100	33	1.31	210	8.33

Statistical associations and interpretation

Additionally, the students' academic affiliation was tested for association with self-medication using Chi square X^2 test. A significant association existed and p -value was observed to be less than 0.05 it was reported that the observed count was greater than the expected count with shows a significant surge in the observed count as compared to what was expected theoretically by chi square X^2 test which supports the alternative hypothesis (HA) that pharmacy students despite being aware of the untoward effects indulge in irresponsible self-medication of psychoactive stimulants and antidepressants.

DISCUSSION

The male to female student's ratio in this study represents the true enrollment at the various medical and health sciences schools in urban areas of the country and health care institutions usually comprise of mainly female students which constitute even more than 3/4th of total enrollment in certain medical universities [13,14].

This study sheds light upon a sensitive aspect of academic environment besides the unregulated availability of prescription only drugs especially with greater propensity of abuse. Results of the study show extensive use of antidepressants with prevalence of 8.34 (8.03 – 8.85 for 95% CI) and noticeable consumption of psychoactive stimulants with prevalence of 1.31 (1.13 – 1.75 for 95% CI) among the final year students. These results also portray a similar picture in development of self-medication problem to that of the United States, where a considerable proportion of college students use antidepressants and psychoactive stimulants to

either avoid the episodes of social anxiety, cope with the extra burden of studies or in the latter case, to boost their performance, concentration, alertness and/or simply for recreational purposes [15].

It is pertinent to mention that in our study the students of pharmacy institutions who are becoming experts on medications and know the hazards of these prescription medicines (98 %), are themselves involved in this practice. This occurrence could be partially supported by the fact that the knowledge of drugs among these students draw them to self medicate initially which might lead to their persistent use latter.

While analyzing the results at the level of public sector and private sector pharmacy institutions, it was observed that the use of antidepressants was equally prevalent in the public sector institutions (8.97 %) and privately held institutions (7.32 %). However, there is a significant difference between the male students of public (17 %) and private sector (8 %) institutions. This whole scenario could be associated to various factors specially that the learning environment of public sector universities is stringent and the facilities are relatively limited which leaves the students with an overall extra burden to put more efforts in studying the similar contents as compared to the students in the private sector institutes [16]. Additionally male students who attend public universities usually belong to middle income class and mostly earn their way to support the tuition fee. This tends to make the male students more prone to depressive behavior and may be that could be the confounding factor associated with high use of antidepressants among public sector males as compared to private sector. Moreover, teachers in the private institutes, owing to their contractual job requirements in most of the cases, tend to

give more time to students. Along with that the lower student to faculty ratio results in better student-faculty interaction and individualized attention on the students. These factors render the private institutional student less susceptible to depressive behavior specifically due to the lesser academic workload upon students [15-17].

On the other hand the scenario of use of psychoactive stimulants is reasonably contrasting. Of overall 1.31 % students agreeing to have been using these drugs primarily to boost their academic performance, almost all the majority are females with 3.94 % prevalence among all females at private universities while the public sector female students accounted for a fractional proportion (0.43 % of all females in public institutions). Interestingly male students in private as well as public sector universities didn't contribute significantly to the psychoactive stimulant users and only 2 students, 1 each in private and public sector institutions admitted to have indulged in this activity. The prevalence of non-prescription use of psychoactive stimulants is in relevance to the values observed from the national survey of colleges in the US in 2001 [16,18].

It is relevant to mention here that a large fraction of students who use the stimulants preferred not to mention the reasons due to some being taboo and in contradiction to societal norms. Some of them did however mention it verbally to same gender interviewers that they use them for ecstasy and recreational purposes that is also suggestive of drug abuse and addiction. The astonishing majority of female students using psychoactive stimulants observed in the private sectors colleges is in accordance with a report documented earlier in mass media after interviews with various college students and particularly highlighted the fact that most of the psychoactive stimulants users are particularly females and belonged to higher income class of the society [19]. It is also worth mentioning at this point that this fraction of students accounts only ~10 % of the total students enrolled in the pharmacy schools in Pakistan. It has been reported earlier that due to unregulated community pharmacy setup in the country, these drugs are available without prescription. Additionally it becomes cause of concern that more and more students are likely to indulge in inappropriate use of these prescription-only medicines grossly due to their competitive-advantage rendering effect.

This study warrants more in-depth studies across various disciplines in the country and raises the questions before the concerned authorities to

take serious measures before this specific social stigma could overtake the students in other disciplines and general people alike in this ever competitive social structure.

Limitations of the study

This study did not include questions regarding the economic status of students which can be an important factor that influences this type of self-medication. Moreover, this study was only performed on pharmacy students and thus cannot be validated to students in other disciplines, thus necessitating the need to extend the study to these other categories of students. Furthermore, it is possible that many students did not disclose fully as the use of psychoactive stimulants is considered a taboo in Pakistan society, and hence, a future study should include measures to address this issue also.

CONCLUSION

Despite being aware of the health hazards of drugs more than any other category of undergraduate students, irresponsible self-medication with psychoactive stimulants and antidepressants medications is high among undergraduate pharmacy students in Pakistan due to academic competition and pressure. Awareness campaign should be employed to minimize the inappropriate use of psychoactive stimulants by students. The undergraduate curriculum should be revised to further enlighten students. Legislation may also be needed to stop the unauthorized availability of psychoactive stimulants and antidepressants.

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