Psychoactive substances abuse is a global health issue. In universities, the use of psychoactive substances is growing gradually. Any substance which acts specifically on the Central nervous system (CNS) and changes the brain functioning is known as psychoactive substance. CNS stimulants are among the most abused drugs, but they have significant clinical use, e.g. analeptic stimulants, psychomotor stimulants, and methylxanthines. The most noticeable period of students’ life is their undergraduate and/or post-graduate studies in which they may be indulged in drugs to cope with peer pressure, academic stress, and popularity of psychoactive substances. Evidence from different sources has also indicated that stress is the main reason which may predispose students to take psychoactive drugs. According to the 2015 World Drug Report of UNODC, opioids/opiates, cannabis, and amphetamine-type stimulants (ATS) are now the top 3 actionable drugs worldwide. Amphetamine is a potent Central Nervous System (CNS) stimulant and most abused substance. Opioids, such as morphine are narcotic analgesics and are a frequently abused substance. Excessive use of such opioids like morphine causes addiction, psychological, and physical dependence. It also induces neuronal dysfunction. CNS stimulants enhance strength and improve performance. Chronic use is linked with adverse effects like cerebrovascular accidents, seizures, psychosis, and these complications mostly occur in the body with pre-existing risk factors. Nicotine, a stimulant is available as a medicinal agent in chewing gum form to overcome the withdrawal symptoms. Alcohol use & indulgence in drugs by students have become a global concern. The problem of psychoactive substance abuse has historically been linked to health care professionals due to their proximity to the drugs. Caffeine, a
component of chocolate, coffee, and soft drinks, is largely consumed and it has strong effects on the human body. Lysergic acid diethylamide (LSD) acts as an agonist at the 5-HT2A receptor in the CNS and as antagonist at peripheral 5-HT receptors' sub-types. Treatment is being initiated in different healthcare systems in a mannered pattern. Two types of treatments are present for controlling drug abuse: one is psychosocial treatment & other one is therapeutic treatment. However, each form of treatment has some limitations due to its inevitable side effects and withdrawal symptoms. Very little published data is available, which specifically focuses on substance abuse in medical students in Pakistan, none of which covers the area where this study was performed.

**METHODOLOGY**

This cross-sectional questionnaire-based study was conducted in medical college and universities among medical students of Lahore, Pakistan, from August 2019 till the end of September 2019. The names of the institutes were not publicized as to maintain confidentiality. Before starting the study, research approval from Research & Ethics Committee of Foundation for young researchers, Lahore, Pakistan (Ref. #FYR/R&EC/13/2019) was obtained. Confidentiality of the participant name was maintained and consent was taken from the participants. The target sample size was 165 students and calculated by using online Raosoft sample size calculator. The sample size was calculated by keeping the population size as 500000, response distribution as 50%, while confidence interval and margin of error were set at 80% and 5%, respectively. However, a total of 200 students were contacted to participate in this study. Consecutive sampling technique was used to recruit the study participants. The questionnaire regarding the use of psychoactive substances and the associated factor of its use were developed by performing literature research. The questionnaire consists of different sections containing 25 closed-ended questions. The questionnaire was developed and approved by the pharmacy practice experts' professors to validate the data. The aim and instructions of the research project were clarified to participants before filling the questionnaire with signed consent. Both male and female student of age more than 18 years old and not more than 25 years were selected. All the questionnaires were checked for completeness of response and incomplete were expelled out from the final data. After getting the forms first data were encoded in SPSS-21 to maintain the confidentiality of the respondent. All the data was incorporated in statistical Package for the Social Sciences version 21 to find results. All the categorical variables like demographic and other study questions were described in frequency (n) and percentage (%). The study flow diagram is presented in figure.

**RESULTS**

From the total 200 respondents, 96 (48%) were males and 104 (52%) were of females. In our study, we have found that the maximum number of students, i.e. 154 (77%) belonged to the age group 21-25 years. Moreover, about 46 (23%) of the students were aged between 15-20 years. Approximately 3/4th of the participants 137 (68.5%) were studying Pharm.D (Doctor of Pharmacy) and 63 (31.5%) had MBBS level of education. Majority of the study participants 54 (27%) and 51 (25.5%) were belongs to 3rd and 4th year of their degree respectively. However, 39 (19.5%) were from final year or 5th year of their degree. The maximum number of students knew about psychoactive agents. Among them, 194 (97%) of the students knew psychoactive agents while only 6 (3%) did not know psychoactive agents.
About 42 (21%) of the students agreed on using psychoactive agents and 158 (79%) of the students refused using such agents (table-I).

Joy seeking and a friend’s offer were found to be the most common causes of starting the drug’s use, both contributing 30 (15%) and 40 (20%) respectively. Other reasons included the inability to resolve routine problems 38 (19%), studies burden 24 (12%), curiosity 22 (11%), family issue 18 (9%), and low self-confidence 14 (7%), to eliminate shyness 4 (2%), presence of addicted person 8 (4%) and due to diseases only 2 (1%). Various psychoactive substance abuse by study participants was presented in table-II as; Tobacco was found to be the most commonly used drug by 30 (15%) students. Marijuana 18 (9%), cocaine 18 (9%), and methamphetamine 18 (9%) were the second most common drugs of abuse. Alcohol 16 (8%), benzodiazepines 16 (8%), and heroin 16 (8%) were the third most common drugs of abuse. Other drugs of abuse included ecstasy 14 (7%), LSD 8 (4%) and methadone 6 (3%).

Among the abuser of psychoactive substances, using drugs before exams 14 (33.33%) were the most common occasions of drug usage by students. Moreover, drugs’ consumption at parties and homes accounted for 10 (23.80%) and 4 (9.52%) of the total usage respectively. According to statistics, 14 (33.33%) of the students who used drugs stated that they use drugs in the form of a cigarette. Chewing gum was being used 4 (9.52%), drug in form of a tablet was used 6 (14.28%), powder form was used 4 (9.52%), drug in form of drinking liquid was used 6 (14.28%) and consuming them on the streets 14 (33.33%) were the most common occasions of drug usage by students. Moreover, drugs’ consumption at parties and homes accounted for 10 (23.80%) and 4 (9.52%) of the total usage respectively.
and 4 (9.52%) of students were reported taking the drug in form of injection and 4 (9.52%) used inhalable vapors. According to data collected, 22 (52.38%) of students take drugs in the form of smoke. Oral, injection, and patch consumption are found to be 10 (23.80%), 4 (9.52%), and 6 (14.28%) respectively (table-III).

Among of the total abusers, 16 (38.09%) of students use drugs once a week, 14 (33.33%) use more than once a day, 6 (14.28%) use drugs once a day and several times a week was used by 6 (14.28%) of students. The maximum number of students 30 (71.42%) get drugs from their friends. Other sources included relatives 6 (14.28%), medical store 4 (9.52%), and drug dealers 2 (4.76%). In current study according to drug users, 28 (66.66%) of students use their pocket money for buying drugs, 8 (19.04%) take the money from their friends and 6 (14.28%) take money from their relatives for buying drugs. Most commonly experienced side effect of drug abuse was found to be sleep disorder 12 (28.57%). Nausea 10 (23.08%) and dry mouth 10 (23.08%) being second most common side effect. Others include mydriasis 4 (9.52%), constipation 4 (9.52%), and diarrhea 2 (4.76%) (table-IV).

**DISCUSSION**

Despite the spiritual and lawful rules implemented in Pakistan regarding use of psychoactive substance in any form with prescription. This study alarmingly shows high prevalence rate. In this research, researcher’s aimed to explore the reasons of abuse and patterns of use was checked.

The current study revolved between medical students and from these, majority of the respondents were females 104 (52%) and 96 (48%) were males. In 2016 Osman et al conducted the study in Sudan in which they found the number of female respondents exceeding that of males because of the majority of females in institutes. Similar results were also found in another study where males were only 47.8% while females were 52.2% as respondents. Interestingly, we have found that the maximum number of students, were belonged to the age group 21-25 years as mentioned earlier in above section and few were belongs from 15-20 years category. The overall prevalence of substance abuse in our study was determined to be 21%, and the prevalence of drugs in medical students determined by Arora et al. is 20.43%. These results were reinforces our study. Furthermore, most common causes of starting the drugs abuse was joy seeking and a friend’s offer contributing 15% and 20% respectively. In a plethora of studies carried out in Saudi Arabia and Taiwan revealed that stress relief, joy seeking, curiosity and influence of friends were the important predisposing factors for drug use in students. Tobacco was found to be the most commonly used drug by majority students and the other most abused psychoactive substances were marijuana, cocaine and methamphetamine but alcohol, benzodiazepines, heroin, ecstasy, and methadone were less abused by the medical students. In a study, the most reported...
abuse drugs by medical students were methamphetamine, heroin, benzodiazepines, ketamine, and zolpidem. Ecstasy abuse seems to have re-emerged and has increased gradually since 2010\textsuperscript{14}. In another study among medical students after alcohol and tobacco, marijuana is the most frequently abused substance\textsuperscript{15}. Medical students abuse drugs before exams and consuming in the streets were observed the most common occasions of drug usage. Moreover, drugs’ consumption at parties and homes accounted less of the total usage. The statistics presented in this study exhibit cigarette was the most abused form of psychoactive substance use after tablet form. The observed prevalence of cigarette smoking in the current study was high as compared with a study conducted in Iran where the prevalence of cigarette smoking was 17\%\textsuperscript{16}. The pattern of the drug’s use were presented in (table-IV) as approximately forty percent of students use drugs once a week. Drug abuse pattern was of higher concern as to evaluate the abuser. A study performed in Iran reports that the majority of abusers used drugs daily\textsuperscript{16}. The difference in results was due to the study setting, population of interest. The maximum number of students get drugs from their friends. Such results were familiar with studies by Mir et al and Jagnany et al where friends and peer pressure were the major source of drug supply and abuse initiation\textsuperscript{17,18}. The relationship between money and drug abuse is of particular interest, as the abuser used all of the income for drugs. In current study according to drug users, around 2/3\textsuperscript{rd} of the participants use their pocket money for buying drugs, other take the money from their friends and relatives for buying drugs. These findings were consistent with another study where students use their pocket money as well as use some other resources for obtaining drugs\textsuperscript{19}. This study stated the incidence of different kinds of psychoactive substance abuse by the medical students and unwavering certain connected factors regarding the use. This study will help in planning and assessing interferences by keeping in mind about the risk factors as well as indicates which new polices are needed for the medical institutes to control the abuse of substances.

RECOMMENDATION

The Government should take steps to control the manufacturing, distribution, and sale of cigarettes as it is a highly abused form of the drug. Medical institutes should charge heavy fines on students who are found smoking. The sale of other forms of psychoactive substances should be monitored strictly. Parents should play a significant role in monitoring their children’s pocket money, activities, and keep an eye on their friend’s circle, as friends have been the major source of getting access to drugs. Training on managing the study burden will prove very helpful in the case of medical students as the enormous burden of studies drives them towards abuse of psychoactive agents. Teachers should guide the students in managing their study burden. Teachers training programs should be carried out. Moral and ethics education should be carried out for students as they play a vital role in determining the behavior of a human being and will prove helpful in giving them insight into how bad the drug abuse affects the society and moral character of a person.

CONCLUSION

The study concluded that the drug abuse problem has become the toughest issues among medical students, with the maximum number of students consuming tobacco, which is smoked in the form of cigarettes. Students start psychoactive substances due to study burden and to get relief from stress. Despite being aware of the complications, students use these substances to get relief. The substance used by university students requires special attention and emergency preventive measures. Education and awareness creation on harmful effect of substance use among students should be done. There should be a unit in the institute for counseling, teaching, and training students to cope with stress and problems, its consequences, and predisposing factors. Strategies to reduce the risk of alcohol and substance abuse must be done as soon as possible.
CONFLICT OF INTEREST
This study has no conflict of interest to be declared by any author.

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