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**Original Research Article**

# Prevalence and pattern of psychoactive substance use among female students aged 18-25 years in universities of North India

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## ABSTRACT

**Background:** Prevalence and underlying reasons of psychoactive substance use vary across different age, gender and societal groups. It is an important concern among females as female physiology and psychology makes them more vulnerable to substance dependence. The primary objective of study was to find prevalence, pattern and factors affecting psychoactive substance use among female students (18-25 years).
**Methods:** In a cross-sectional survey, 250 female students were recruited from a university in Chandigarh using multistage cluster random sampling. Survey tool developed by World Health Organization was used in a self administrated format using paper based survey method. Associations among various factors leading to psychoactive substance use were tested using logistic regression model.
**Results:** Lifetime prevalence of psychoactive substance use was 13.6% [95% CI 9.3-17.8, n=34]. Participants reported their use out of curiosity, for having fun, personal problems, easy availability, familial use, etc. 52.9% (18/250) students reported their use within last 3 months; out of them health problems were faced by two. Association of psychoactive substance use was significant for age, socioeconomic status and family history of psychoactive substance use.
**Conclusions:** Due to sensitive nature of reporting substance use, the lifetime prevalence of 13.6% among female young students may be an underestimation. Familial psychoactive substance use exposes their wards to its use, especially under psychological stress. Qualitative research should be performed to understand why some female students use psychoactive substances while others abstain themselves from using these at all or abstain from their use for a long time after first exposure.

**Keywords:** Female students, Psychoactive substance, Substance use pattern

## INTRODUCTION

Psychoactive substance use is a growing problem in both developing and developed countries. The abuse of prescription drugs and psychoactive substances like heroin, cannabis, smack, crack etc. has increased considerably in youth population, along with already high burden of alcohol and tobacco consumption.[1-3]

In India, psychoactive substance use is a growing problem among males, and females are no exception now.[3,4] Reasons for initiation of substance use may vary for different populations especially in the vulnerable age groups or professional groups like students, and business process outsource (BPO) employees.[5]

It is a well-established fact that females are more vulnerable to the devastating effects of psychoactive

substances because they are prone to accelerated progression to addiction (telescoping effect) resulting in more severe abuse consequences. Neuro-endocrinal system plays the key role as it is responsible for greater risk of addiction and relapse following abstinence in females. The reasons related to consumption of psychoactive substances differ by gender. Males consume alcohol to enhance happiness, but females consume the same to reduce stress and negativity.[6,7]

Based on the fact that the reasons for initiating the substance use may vary in different populations, this study aimed at finding the prevalence and patterns of psychoactive substance use among female university students, especially to find out if the socio-economic status and place of residence of female students during their academic period plays any role in use of psychoactive substances.[8]

## METHODS

### *Study population and design*

Authorities of a university located in Chandigarh city granted permission for conducting the study thus making it a choice. Students of age group (18-25 years) were selected as this age band includes student population admitted to higher centres for academics. Cross sectional study design was used. Total duration of study was from May 2015 to December 2015. Data collection was done during period from June-August 2015.

### *Sample size and sampling technique*

Based on the previously known prevalence of 8.9% among females in a national level study, the sample size estimate was 250 female students after adjusting for design effect (value of DEFF was taken as 2). Multistage cluster random sampling technique was used for selecting the study sample.

Number of clusters (primary sampling units) was decided to be 10. This was appropriate to cover the academic departments with higher population, serving as clusters. These were selected using simple random sampling. Sample population within each cluster was also selected randomly and was proportional to size of selected cluster.

The study was restricted to only females, a particular age group and a particular profession (students, in this case), as a measure to control confounding at design stage

### *Study tools*

Revised version of Kuppuswamy socio-demographic questionnaire and adapted version of the Alcohol, Smoking and Substance Involvement Screening Test of World Health Organization (WHO ASSIST V3.0) were used to collect socio-demographic and psychoactive substance use information respectively.[9,10] The questionnaire was pre-tested before executing the survey as it was adapted into a self-administered version, both using paper based and online survey method. Due to complexity of online data collection tool, the pre-testing proved to favor paper based data collection method.[11] Based on the ethical principles, the interviews were conducted after taking written informed consent. The questionnaire was designed in a way so as to maintain confidentiality of respondent. Confidentiality of data was maintained and study protocol was approved by institutional ethical committee.

### *Ethics*

The study was conducted after obtaining clearance from Institutional Ethical Committee. The participants were enrolled in survey after taking their written informed consent.

### *Data collection*

The selected study participants were contacted in the university and briefed about purpose of conducting the survey and voluntary nature of participation. They were given sufficient time to decide whether they wanted to participate. The questionnaire was handed over to the participants who agreed to participate. They were asked to fill the same as per their convenience, i.e. either to fill the questionnaire at leisure and hand it over next day or fill it in a classroom then and there. Most of them (n=198, 79.2%) agreed to fill it in the classroom. Rest of the participants insisted to take more time to think about participation. But, in all instances, the participants agreed to participate the same day they were first contacted. It took about 5-15 minutes to fill the questionnaire.

Ten female students did not participate in the study. They were either unavailable during the study (n=2), did not agree to participate (n=3), marked incomplete responses to few questions (n=2) or lost the questionnaire (n=3).

Prevalence of psychoactive substance use was estimated based on participants' use of psychoactive substances at least once in their life, giving life-time prevalence at the time of survey.

The use of psychoactive substance was dependent variable in bivariate analysis. Independent variables included in the analysis were age of participants, family history of psychoactive use, place of residence, number of years away from home during academics and socio-economic status. The p-value of 0.05 was taken as cut-off value for the association to be statistically significant.

### *Statistical analysis*

Univariate and bivariate statistical analysis was done using Statistical Package for Social Sciences (SPSS) version 16 software, whereas, STATA version 11 was used for multivariate analysis to perform logistic

regression to control for potential confounders. Analysis of psychoactive substance use pattern was done as per the WHO ASSIST instructions.[12]

According to WHO, psychoactive substance is defined as the substance that when taken in or administered into one's system, affect mental process, e.g. cognition.[13] Ever user was a respondent, who reported having taken one or more substances ever in life mentioned in the interview tool.[14] Regular user was a respondent, who accepts having used one or more mentioned substances during past one year AND has been taking it at least once a week or several times in the previous month fulfilling two conditions of time dimension (a year plus once a week in previous month/several times in previous month).[9] This may point out towards a fine-tuned habit, which could end up as dependence (an adaptive state, which results from repeated drug administration). The current use considered in this study means repeated use of psychoactive substances after initiation, given that the user may not strictly be a regular user (with defined time dimension, as stated in the definition of 'regular user'). However, no such time dimension as of regular use is included to define the current use in this study. The current use guide finds out the factors that motivate or force the participants to use one or more psychoactive substances again, at any point in life, with no intention to stop using the substance, as informed verbally by the participant while citing reasons for use.

## RESULTS

Two hundred fifty female students were selected for the study. Mean age of study participants was 21.3 years (SD 1.8). Among them, 42% of the study participants were residing with parents, rest of them was staying away from parents (in hostels, as paying guests or at relatives' place). The proportion of undergraduate and postgraduate students was 48.8% and 51.2%, respectively.

Lifetime prevalence of psychoactive substance use was 13.6% (34/250) [95% CI 9.3% -17.8%] at the time of survey. Of these, 2 participants (5.8%) were regular substance users (having used one or more mentioned substances during past one year and had been taking it at least once a week or several times in the previous month), whereas, 22/250 participants were current users. It means that out of 34 psychoactive substance users, 35% (12) were not re-exposed to the psychoactive substance use more than once in their life.

Maximum number of females (47%, n=16) reported to have started use of psychoactive substances out of curiosity and for having fun. Of the 22 current users, 15 had started use of psychoactive substances as an idea of fun (Figure 1A and B).

Mean age of psychoactive substance users (n=34) was 22.2 years. Nearly 73.6% study participants belonged to the upper middle socio-economic class families followed by upper socio-economic class (20.4%), lower middle socio-economic class (5.2%) and lower socio-economic class (0.8%) families. Approximately, 38% (n=95) study participants reported positive family history of psychoactive drug use. Alcohol was found to be the primary psychoactive substance used by female students (Figure 2). One participant reported to have explored the lysergic acid diethylamide (LSD), a synthetic drug.

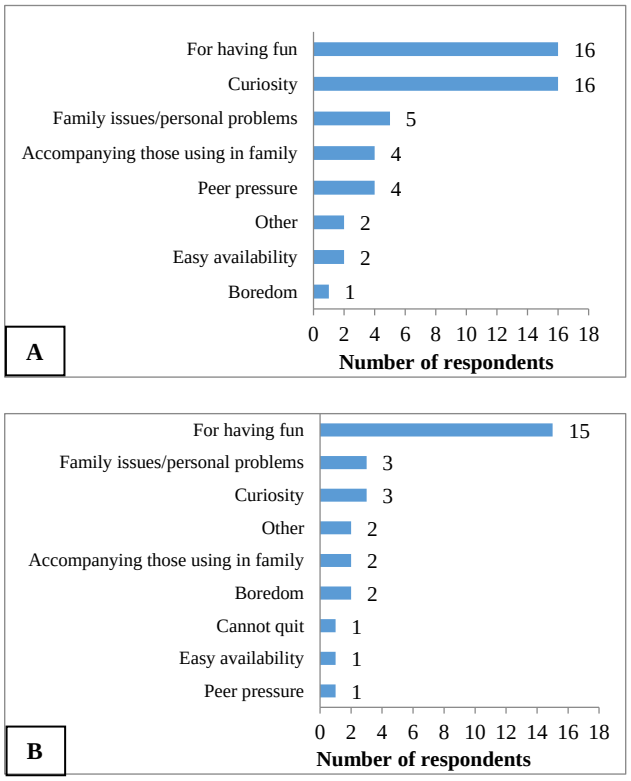


**Figure 1: Reasons for using psychoactive substances by female university students aged 18-25 years (multiple responses): (A) First time use of various psychoactive substances (n=34); (B) current use of psychoactive substances (n=22).**

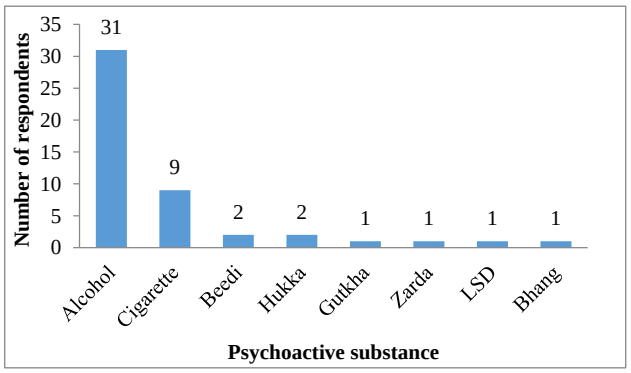


**Figure 2: Distribution of various types of psychoactive substances used.**

The questionnaire revealed the pattern based on various aspects of use of different psychoactive substances over a period within three months from survey. Twelve

participants reported a strong desire to use the psychoactive substance once or twice during three months. A few responses mentioned substance use is associated with health (5) and social problems (3) before or during three months (n=2) (Table 1).

**Table 1: Pattern of psychoactive substance use by female university students aged 18-25 years.**

| Variables | Number (n=34) | Percentage (%) |
|---|---|---|
| **Substance use within last 3 months** | | |
| No | 16 | 47.1 |
| Yes | 18 | 52.9 |
| Once/twice | 12 | 66.7 |
| Monthly | 7 | 38.9 |
| Weekly | 3 | 16.7 |
| Almost daily/daily | 1 | 5.6 |
| **Strong desire to use substance within last 3 months** | | |
| No | 20 | 58.8 |
| Yes | 14 | 41.2 |
| Once/ twice | 12 | 85.7 |
| Monthly | 2 | 14.3 |
| Weekly | 4 | 28.6 |
| Almost daily/daily | 1 | 7.1 |
| **Problem faced due to substance use** | | |
| Health problem | | |
| Never | 27 | 79.4 |
| Ever | 5 | 14.7 |
| Within 3 months | 2 | 5.9 |
| Social problem | | |
| Never | 31 | 91.2 |
| Ever | 3 | 8.8 |
| **Concern expressed by anyone regarding habit** | | |
| Never | 23 | 67.6 |
| Yes, but not within 3 months | 8 | 23.5 |
| Yes, within 3 months | 3 | 8.8 |
| **Unsuccessful attempts to cut down, stop or exercise control over psychoactive substance use** | | |
| Never attempted a try | 30 | 88.2 |
| Attempted a try and failed, but not within 3 months | 3 | 8.8 |
| Attempted a try and failed, within 3 months | 1 | 2.9 |

**Table 2: Association of various socio-demographic factors with substance use among female university students aged 18-25 years.**

| Socio-demographic factors | Number | Substance use | | P value |
|---|---|---|---|---|
| | | n | % | |
| **Age(years)** | | | | |
| 18-19 | 52 | 2 | 3.8 | |
| 20-21 | 81 | 11 | 13.6 | 0.02 |
| 22-23 | 86 | 12 | 14.0 | |
| 24-25 | 31 | 9 | 29.0 | |
| **Socio-economic status** | | | | |
| Upper | 51 | 10 | 19.6 | |
| Upper middle | 184 | 24 | 13.0 | 0.3 |
| Lower middle | 13 | 0 | 0 | |
| Upper lower | 2 | 0 | 0 | |
| **Family history of psychoactive substance use** | | | | |
| Negative | 155 | 12 | 7.7 | 0.001 |
| Positive | 95 | 22 | 23.2 | |

Continued.

| Socio-demographic factors | Number | Substance use | | P value |
|---|---|---|---|---|
| | | n | % | |
| **Number of years away from parents** | | | | |
| 0 | 105 | 18 | 17.1 | 0.04 |
| 1-3 | 83 | 5 | 6.0 | |
| 4-6 | 39 | 5 | 12.8 | |
| >7 | 23 | 6 | 26.1 | |

**Table 3: Logistic regression model to evaluate effect of socio-demographic characteristics and psychoactive substance use among participants.**

| Variable | Unadjusted | | | Adjusted | | |
|---|---|---|---|---|---|---|
| | Odds ratio | 95% CI | P value | Odds ratio | 95% CI | P value |
| **Age (years)** | 1.4 | 1.1-1.7 | 0.003 | 1.4 | 1.1-1.8 | 0.003 |
| **Socio-economic status score** | 0.5 | 0.2-1.0 | 0.06 | 1.2 | 1.0-1.3 | 0.007 |
| **Family history of psychoactive substance use** | 3.6 | 1.7-7.7 | 0.001 | 3.9 | 1.8-8.6 | 0.001 |
| **Years away from home** | 1.1 | 0.7-1.5 | 0.7 | 1.0 | 0.9-1.2 | 0.7 |

Chi square p value of model<0.0001.

**Table 4: Treatment intervention requirement for using psychoactive substances.**

| Psychoactive substance | N | Need no intervention | Need brief intervention | Need intensive intervention |
|---|---|---|---|---|
| **Alcohol** | 31 | 29 | 2 | 0 |
| **Tobacco** | 16 | 11 | 5 | 0 |

About 33% users (11) said that someone in their social circle had expressed concern over their use of psychoactive substances, and 12% (4) said that they had tried to stop use but had failed. About 41.2% of the psychoactive substance users expressed the desire to use the same (Table 1).

The relationship between place of residence of participants during academic session at the time of survey and socio-economic class with psychoactive substance use was non-significant. However, the age of study participants and family history of psychoactive substance use both showed significant association with psychoactive substance use among the participants in the bivariate analysis. Also, a statistically significant increasing trend was observed between age and psychoactive substance use (p=0.004) (Table 2).

Association of psychoactive substance use among participants with duration away from home was statistically non-significant after adjusting for the effect of age, socio-economic status and family history of psychoactive substance use (Table 3).

## DISCUSSION

The lifetime prevalence of psychoactive substance use among female university students was 13.6% (95% CI 9.3-17.8). Slightly higher prevalence among females (14.71%) has been found in an Indian study conducted on undergraduate medical students of almost similar socio demographic and characteristics.[15] Psychoactive substance use among male college students was approximately five times higher than females of similar age group.

Alcohol is the primary psychoactive substance used by female students. Other researchers have presented results similar to this study for males and females.[16, 17] On the other hand; evidence reports that females tend to misuse the pharmaceutical products too.[18]

Age, socio-economic status and family history of psychoactive substance use were found to be significantly associated with psychoactive substance use in this study. An interesting finding of this study, though statistically non-significant, is the relatively higher proportion of psychoactive substance use among female students living away from the parents for more than 5 years as compared to those staying with parents. Other studies have reported that those living away from parents are likely to use psychoactive substances more often.[9,15] But the fact that family history of substance use has an influence on the individual's behavior towards the same habit could be the primary determinant.[16] Over a span of few years, the level of psychological stress among students has increased; hence psychoactive substance use can occur irrespective of whether the individual is living with or away from parents.[16] Now-a-days; the exposure of youth of both the genders has increased to the use of psychoactive substances; familial use, may be, is the major influencer.[16] It is difficult to attribute causation to a single factor when multiple risk factors operate in society.

Apart from the above findings of interest, increasing age is also significantly associated with use of psychoactive substances among female university students. This may be because of the fact that the age not only brings with it the sense of responsibility, but also the sense of independence and ability to take decisions for self. In an open and competitive environment of an education institution, these factors tend to gain importance as now the student has to handle many personal and professional issues on her own. Parental influence on choosing friends, completing assignments, studying during examinations, etc. in adulthood is not as much intense as it is during the childhood. Studies from other parts of India have revealed the evidence of similar trend with higher substance use in the pupils of 23±2 years of age. Similar trend is observed in male college students too.[17]

As per this study, the first time and repeated exposure to the use of psychoactive substances among female university students is led by its impression as an idea of having fun and curiosity followed by family issues or personal problems, psychoactive substance use in the families, peer pressure and easy availability.[19] Other studies also showed that most of the young adults choose to use the psychoactive substances because it acts as a pleasure aid.[20] Curiosity and psychological stress are also some of the primary reasons of psychoactive substance use in males and females.[16] This favors the fact that the reasons for psychoactive substance use vary significantly among females of different occupation and age groups.

About 41.2% of the female students who were exposed to the use of psychoactive substances have expressed the desire to use the same. Though some participants have reported that psychoactive substance use is associated with health and social problems, but, some female student substance users expressed failure of controlling the habit when tried. A certain proportion of female students need brief intervention due to relatively excessive use of psychoactive substances including alcohol and tobacco in the form of cigarettes to have a check on their habitual psychoactive substance use as they perceive themselves to be at risk of health and other problems from their current pattern of substance use. Studies done in past tend to shed light on possible association of excessive psychoactive substance use and occurrence of various psychological disorders in females and the management of psychoactive substance use itself.[8,10]

There are studies which state that use of cigarette is more prevalent than the use of alcohol in both sexes.[14,20,21] The dependent tobacco use has been found to be higher among females though.[13] Thus, it can be said that the burden of tobacco and alcohol consumption may be on the higher side, easy legal availability being one of the leading contributors.[22]

The pattern of psychoactive substance use in females varies from males of the same profession and age in terms of proportion of males using psychoactive substances at various times.[23] The ‘once or twice in three months’ pattern of use of psychoactive substance use was followed by 12 out of 34 users. Monthly use of psychoactive substances in three months is about 20.5%, consistent with the finding of a study done by Kalpana and Kavya.[21]

The proportion of females having weekly or daily use of substances seems to be lower than the proportion of females needing any sort of intervention. It is because of the reason that only the pattern of psychoactive substance use is not important factor in deciding whether the individual is at risk of facing any problems, there are other psychological factors like failed attempts to control the habit or desire to use the substance again that make individual prone to risk of encountering health or social problems if the self-control or behavior modification is not given an importance.

There are variations in the reasons of psychoactive substance use among females in different settings (i.e. occupational group, age group, etc.). The literature available across India and other countries favors this argument.[24-27] The evidence favors the fact that female physiology and psychology makes them more vulnerable to devastating effects of substance abuse.[16,17,21,28,29] Thus, this study provides a basis for comparing the findings obtained from other setting, which can further be used to find how and why the reasons for substance use vary with profession and age.

It was observed that some participants (n=12) did not respond to the reason for repeated use of psychoactive substances. This may be due to their apprehension of being considered as ‘alcoholics’ or ‘smokers’ or so. The use of psychoactive substance use among females itself is a sensitive issue; there are chances that many of the study participants may have denied using the psychoactive substances at any point in time. Taking into consideration the underreporting it is suggested that an online survey methodology should be designed and tested to reduce the social desirability bias.

The questions regarding reasons of not using the psychoactive substances at all or for a long time after first exposure were not asked, which could have provided a better idea about differences between the characteristics of users and non-users. There could also be questions for non-users or former users about the activities done by them for obtaining pleasure, having fun, alleviating boredom and psychological stress which would give an idea about how easily some are attracted toward using drugs and how others are able to exercise self-control.

## CONCLUSION

To conclude, it can be said that though the use of psychoactive substances among females is far less as compared to males, it still remains a matter of concern. Considering the sensitive nature of reporting

psychoactive substance use, the lifetime prevalence of 13.6% should be considered as an underestimation. The reasons to expose oneself to the psychoactive substance use should be studied thoroughly so as find and tackle any underlying cause associated with mental health.

***Recommendations***

Based on the findings of this study, it is recommended that parents should be made aware about the issue of psychoactive substance use pertaining to the positive family history of psychoactive substance use so that they are able to understand that it is an important factor that may act as reinforcing force in exposing their wards to the use of these substances especially under conditions of psychological stress. Qualitative research should be performed in educational institutions in different regions of India to obtain information on factors like why some people use psychoactive substances while others abstain themselves from using the psychoactive substances at all or for a long time after first exposure.

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