Original Article

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# Depression and Tobacco Use Among University Students of Chattogram

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**ABSTRACT**

***Background:*** *University students are at a higher risk of substance use. Depression is associated with a noticeable decline in academic performance and can increase the risk of substance use. This study aimed to find the pattern of depressive symptoms and tobacco use and the association between these two among university students in Chattogram city.*

***Materials and methods:*** *A cross-sectional study was conducted from January 2022 to December 2022 among a convenience sample of 450 university students in four universities of Chattogram City. Past and current pattern of tobacco smoking and use of smokeless tobacco use were measured by self-report. Depressive symptoms were measured by the 9-item Patient Health Questionnaire (PHQ 9) scale. Association between depression and tobacco use was determined by bivariate logistic regression analysis.*

***Results:*** *Out of 450 students, 42 (9.3%) students were smoking tobacco or using smokeless tobacco currently. The depression rate was 64.9% (Respectively, 27.3%, 20%, 10%, and 7.6% had mild, moderate, moderately severe and severe form of depressive symptoms). Logistic regression analysis revealed that current smokers and/or smokeless tobacco users were 2.13 (Odds ratio: 2.13, 95% confidence interval: 1.19-3.18) times more likely to have moderate to severe depression than the students who were not smoking tobacco or using smokeless tobacco currently.*

***Conclusion:*** *The study findings suggest the urgent need to address depression and tobacco use among university students in Chattogram by educating them about mental health, identifying high-risk students and offering easily accessible psychological help.*

**Keywords:** Depression; Tobacco use; University students.

## Introduction

WHO defines depression as a common mental disorder, characterized by persistent sadness and loss of interest in activities normally one enjoy along with an inability to carry out daily activities for at least two weeks. Depression is a leading cause of ill health and disability, affecting people of all ages. It is estimated that more than 300 million people suffer from depression worldwide and this prevalence is most common in middle-income countries such as Bangladesh.[1] National and international policies such as bans on smoking in public places, increased taxes on tobacco products and social messages about the harmful effects of tobacco have been introduced, but increased awareness of its dangerous health effects has been comparatively low. Drug use among children and young adults is a major public health concern worldwide.[2] Young adults who use tobacco early in life are more likely to become regular tobacco users. For many, young adulthood is a time of physical, emotional and psychological maturation and development, experimentation and risky behavior can lead to vulnerabilities, substance use or at risk of abuse.[3] A survey of his more than 4,000 children under the age of 18 with school-going, school-dropping and street children in 100 cities and towns in various states of India found it to be the most commonly consumed item. Some of the substances present were found to be tobacco (83.2%). Alcohol (67.7%) cannabis (35.4%) inhalants (34.7%) pharmaceutical opioids (18.1%), tranquilizers (7.9%) heroin (7.9%). This is a big problem as it is estimated that around 55,000 children in India become addicted to tobacco every

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day.[2] Tobacco use is commonly associated with various types of cancer, heart disease, diabetes, tuberculosis and various other health problems. Results of a study (Natalia et al. 2014) showed that an adolescent who smokes has symptoms of depression and anxiety and uses them as self-medication for emotional distress, compared with 80% of tobacco users worldwide live in low- and middle-income countries. India is the third largest producer and second largest consumer of tobacco and tobacco products in the world. As such, India is one of the countries with the highest tobacco-related mortality and morbidity rates. GATS-2 (Global Adult Tobacco Survey-2) found out that 266.8 million people who are 15 years old or older use tobacco in India. This means 28. 6% of adults in India use tobacco.[4] According to the National Mental Health Survey 2016, in India the prevalence of tobacco use disorders in the general population was found to be 12.5% among people in the 18-29 year old group. The survey also found that 20.9% of the total Indian populations were addicted to tobacco use. The majority of tobacco users start smoking very early, with 87% starting before the age of 18. A survey of 16,953 students from 25 different universities in Asia, Africa and America found that 13.3% of university students were tobacco users. However, the prevalence between countries varied from 6.9% in India to 3.8% in Singapore, suggesting that cultural and social differences influence tobacco use. Studies had disclosed that young people with symptoms of anxiety and depression are at a higher risk of starting to smoke than those who are asymptomatic. A longitudinal study was conducted in Australia and aimed to examine the risk of transitioning to daily smoking and nicotine addiction in adolescents with symptoms of anxiety and depression. Data were collected from 2032 adolescents from 1992 to 2003. Anxiety and depression were assessed using the Clinical Interview Schedule-R. Tobacco use was assessed using his Fagerstrom test for participants with nicotine dependence. The results showed that the lifetime tobacco/cannabis smoking prevalence was 63%, with 51% of the participants starting smoking during puberty and 12% starting smoking during adolescence. Nicotine addiction was seen in 13% of participants. It also found that adolescents with daily smoking habits, who had more anxiety and depression symptoms,
were almost twice more likely to become addicted to nicotine in young adulthood than adolescents with lower levels of depression and anxiety.[5] This descriptive cross-sectional study was carried out to find out the pattern of depression and tobacco use among selected university students of Chattogram Bangladesh.

**Materials and methods**

This was a cross-sectional type of observational study, carried out on students of four Universities in Chattogram city from February 2022 to January 2023. Convenience type of non-probability sampling method was used to select an appropriate number of samples from the universities. Data were collected through using a pretested structured questionnaire consisting of socio-demographic information, comprehensive lifestyle information and psychological health information including a nine-item scale, the Patient Health Questionnaire 9 (PHQ 9) for assessing the level of depression. Data were collected from respondents with the help of a pretested structured questionnaire. The questionnaire comprised of three parts, the first part included student's socio-demographic characteristics. The second part was used to evaluate depression by PHQ-9 scale. The PHQ-9 contains nine questions to assess the depression status of the respondents for the last 2 weeks. Here, each question scored from 0 to 3 points based on the responses. The total score on the PHQ-9 scale is ranged from 0 to 27. The higher scores indicate the presence of more severe depression. A total score below 4, 5-9, 10–14, 15–19 and 20–27 represents minimal, mild, moderate, moderately severe and severe depression respectively. Data were analyzed by using SPSS version 22.0 software. Categorical variables were expressed as frequency and proportion. Quantitative variables were presented as either mean, standard deviation or median (Interquartile range). The association between tobacco use pattern and depressive symptoms was assessed by Chi-square test. Strength of association was expressed as Odds Ratio (OR) and 95% confidence interval for OR. The level of significance was considered at less than 0.05.

*Inclusion Criteria*

- Regular students of the university
- Age 21 to 24 years.

*Exclusion Criteria*

- Previous mental disorder
- Students with history of chronic illness
- Not interested in participating in this research.

Considering time constraints and other limitations, the study performed on 450 students.

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## Results

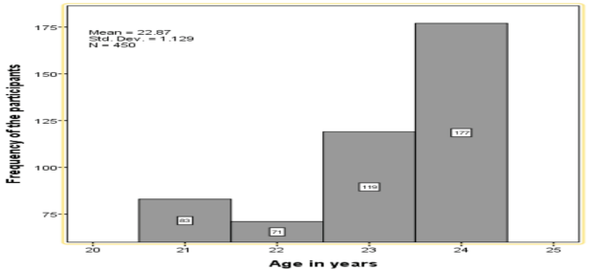


**Figure 1** Age distribution of the students (n=450)

Age ranged between 21 to 24 years in the study with a mean age of 22.9±1.1 years. Most frequent age was 24 years with 177 (39.3%) students, followed by 23 years with 119 (26.4%) students.

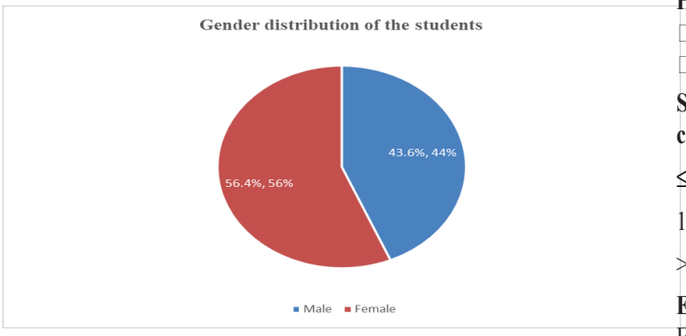


**Figure 2** Distribution of the participants based on their gender (n=450)

There was female preponderance 254(56.4%) in the present study with a female to male ratio of 1.3:1.

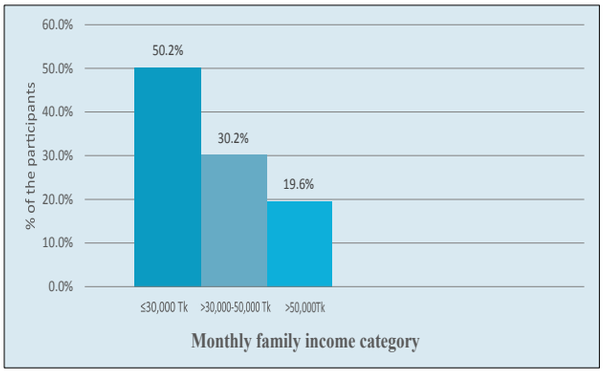


**Figure 3** Monthly family income of the students (n=450)

More than half (226/450, 50.2%) of the students reported that they had monthly income of ≤ Tk. 30,000, followed by 30.2% reported a monthly family income of > Tk. 30,000-50,000 and 19.6% had monthly family income >TK.50,000.

**Table I** Pattern of tobacco smoking and passive smoking among the university students (n=450)

| Characteristics | Frequency | Percentage (%) |
|---|---|---|
| **Currently smoke tobacco** | | |
| No | 408 | 90.7 |
| Yes | 42 | 9.3 |
| **Currently smoke tobacco daily** | | |
| No | 416 | 92.4 |
| Yes | 34 | 7.6 |
| **No. of daily smoking by the current daily smoker (n=34)** | | |
| One to five sticks | 11 | 32.4 |
| Six to ten sticks | 20 | 58.8 |
| >Ten sticks | 3 | 8.8 |
| **History of smoking tobacco in past life** | | |
| No | 419 | 93.1 |
| Yes | 31 | 6.9 |
| **Starting age of tobacco smoking by the current or ex-smoker (n=49)** | | |
| ≤18 years | 25 | 51.0 |
| 19-20 years | 13 | 26.5 |
| >20 years | 11 | 22.4 |
| **Exposure to passive smoking in last 15 days** | | |
| Exposure to passive smoking at home | | |
| No | 328 | 72.9 |
| Yes | 122 | 27.1 |
| Exposure to passive smoking at workplace | | |
| No | 330 | 73.3 |
| Yes | 120 | 26.7 |

Out of 450 undergraduate university students, 42 students reported smoking tobacco currently giving the current smoking prevalence rate of 9.3% (95% confidence interval: 6.7% to 12.0%). The current daily smoking proportion was 7.6% (95% CI: 5.3% to 10.4%). More than half (58.8%) of the current daily smoker smoke 6-10 sticks daily. Thirty-one students reported smoking tobacco daily in their past life, giving the past daily smoking rate of 6.9% (95% CI: 4.7% to 9.6%). More than half (51%) of the smoker (Current or past) started smoking at or below 18 years of their age. During 15 days prior to the study, 122 (27.1%) of students reported seeing more than one person smoking in front of them at home and 120 (26.7%) of the students were exposed to smoking in the university compound or in public places (Table I).

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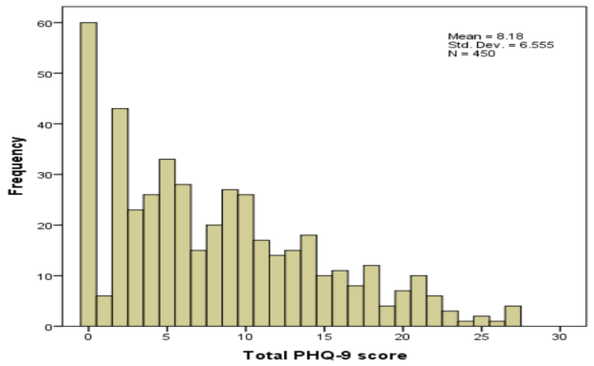


**Figure 4** Distribution of the students by their total PHQ-9 score (n=450)

The mean PHQ-9 score was 8.2 ±6.6 with a range of 0 –27 and the median PHQ-9 score was 7. The most frequently obtained score was 0, obtained by 60 (13.3%) students.

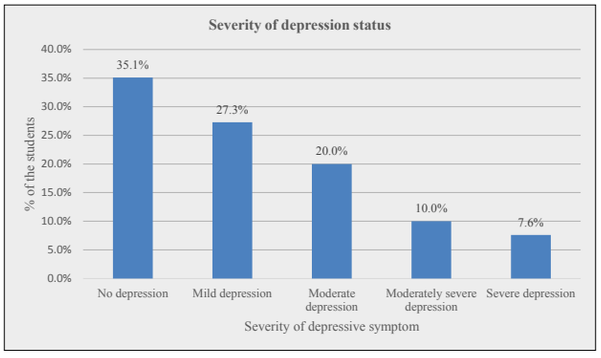


**Figure 5** Depressive symptoms observed among the respondent students (n=450)

In the present study it is depicted that, 158 (35.1%) had no depressive symptoms, 123 (27.3%) had mild depression, 90 (20%) had moderate depression, 45 (10%) had moderately severe depression, and 34 (7.6%) had severe depression (Figure 5).

**Table II** Association between tobacco smoking and depression status (n=450)

| Present tobacco smoking or use | Depression severity: No or mild depression (n=281) | Moderate to severe depression (n=169) | Odds ratio (95% CI) | p value |
|---|---|---|---|---|
| No (n=398) | 257 (64.6) | 141 (35.4) | 2.13 | |
| Yes (n=42) | 24 (46.2) | 28 (53.8) | (1.19-3.81) | 0.01[S] |

Data were expressed as frequency (Percentage). p value was obtained from the Chi-square test. S: Significant statistically, CI: Confidence Interval.

In the study, moderate to severe depression was observed in an overwhelming number of students who were current smokers and/or smokeless tobacco user 28 (53.8%). On the other hand, among non-tobacco smokers and/or smokeless tobacco users, 141 (35.4%) had moderate to severe depression. The association between current tobacco smoking and moderate to severe depression was highly significant statistically (p=0.01). Univariate binary logistic regression analysis revealed that current smokers and/or smokeless tobacco users were 2.13 times (OR:2.13, 95% CI:1.19-3.18) more likely to have moderate to severe depression than their counterpart.

## Discussion

A total of 450 conveniently selected students from four University of Chattogram city in Bangladesh were included in this study to get idea on the association between depression and tobacco use. In the current study, age ranged between 21 to 24 years in the study with mean age of 22.9±1.1 years. Most frequent age was 24 years with 177 (39.3%) students, followed by 23 years with 119 (26.4%) students. There were female preponderance (56.4%) in the present study with a female to male ratio of 1.3:1. More than half (226/450, 50.2%) of the students reported that they had monthly income of TK. ≤ 30,000, followed by 30.2% reported a monthly family income of TK.>30,000-50,000, and 19.6% had monthly family income TK.>50,000. These sociodemographic characteristics might not be representative of the overall university student's population of Bangladesh. The present study results agreed with a previous study results which was conducted two large public universities of Bangladesh found that 45% of the participants were male and the average age of the students was 22 (± 2.2) years. The families of the respondents had an average monthly family income of BDT 28,000.[6] In the present study, the proportion of current smokers among university students was 9.3%. The current daily smoking rate was 7.6%. More than half (58.8%) of the current daily smoker smoke 6-10 sticks daily. Thirty-one students reported smoking tobacco daily in their past life, giving the past daily smoking rate of 6.9%. More than half (51%) of the smoker (Current or past) started smoking at or below 18 years of their age. The smoking rate was quite lower than the previous studies conducted in Bangladesh among other public universities.[7] The overall prevalence of tobacco smoking was 60.2% in the study which was conducted with 264 students of Jahangirnagar University.[8] Passive smoking is similarly hazardous to direct smoking. In the present study, during 15 days prior to the study, 27.1% of students reported that more than one person smoking in front of them at home and 26.7% of the students were exposed

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to smoking in the university compound or in public places. In the previous study it is observed that 7 days prior to the study, more than two-fifth (43.2%) of secondary school students reported observing more than one person smoking in front of them at home. More than one tenth (13%) of the students were exposed to smoking in the school compound, while three-fifths (58%) had witnessed at least one person smoking in public places.[9] Common mental health problems are regarded as public health concerns and can contribute to risky behaviors such as suicide among students in extreme cases. However, there is a lack of studies concerning such issues in Bangladesh. In the present study, depression burden was measured by PHQ-9 questionnaire. In the present study, out of 450 students, 35.1% had no depressive symptoms, 27.3% had mild depression, 20% had moderate depression, 10% had moderately severe depression, and 7.6% had severe depression. A recent study determines the prevalence and associated risk predictors of depression, anxiety and stress among 590 Bangladeshi university students. The prevalence of moderate to extremely severe levels of depression was 52.2% in that study.[10] In the study the prevalence of moderate to severe depression among public university students in Bangladesh was 47%.[11] However, the rate of depression in the present study 64.9% was similar like the rates reported by some previous studies of depression among undergraduate students (52.2%) and first-year undergraduate students specifically (69.5%) in Bangladesh.[12,13] Variation in the prevalence rates reported between studies could be due to differences in the study tools, university academic structure, different geographical locations and different years of data collection. The present study demonstrated a significant association between tobacco use status and depressive symptoms. Moderate to severe depression was observed in an overwhelming number of students who were current smokers and/or smokeless tobacco users 28 (53.8%). On the other hand, among non-tobacco smokers and/or smokeless tobacco users, 141 (35.4%) had moderate to severe depression. The association between current tobacco smoking and moderate to severe depression was highly significant statistically (p=0.01). Univariate binary logistic regression analysis revealed that current smokers and/or smokeless tobacco users were 2.13 times (OR:2.13, 95% CI:1.19-3.18) more likely to have moderate to severe depression than their counterpart. The present study findings agree with previous studies in this regard. Risk factors for depression included coming from a lower-class family, being a cigarette smoker and engaging in less physical exercise in another similar study.[14] Other studies also found a very high frequency of depression among university students and demonstrated an association between smoking and depression.[15,16] Saikia in her study found that tobacco use was the highest among male students having a family member who uses tobacco. It was also found that the majority of the current tobacco users (33.6%) had minimal symptoms of depression. The students who were current or past tobacco users had some level of anxiety and depression in that study.[15] A study on Canadian post-secondary students found a significant association between depression, tobacco use, cannabis use, anxiety and alcohol use.[17] Another study from Bangladesh found depression prevalence was 28.7%. First□year student status, substance use, past□year physical and psychological illness, stressful life events, family psychiatric history and personal suicidal behaviors were the main risk factors.[18]

**Limitations**

Due to the use of the purposive sampling technique, there may be a bias in the conclusion. Accordingly, the reliability and generalizability of the conclusion is limited. Self-reported data of tobacco use and depression may generate recall bias and information bias. A cross-sectional study design did not allow us to make definitive conclusions regarding the temporal relationship between tobacco use and depression.

**Conclusion**

The results of this study revealed a high occurrence of depression symptoms among university students and one in every ten students were currently smoking or using smokeless tobacco. Current tobacco use was significantly associated with depression symptoms.

**Recommendations**

The findings from the study suggest that a combination of mental health services and tobacco use awareness is relevant to enhancing the physical and mental health of the students. Further, elaborate, large scale studies are required to make a strong conclusion on the association between study variables. Scientific background reveals no role of smoking tobacco to improve the mental health. This fact should be established for the students who are our future generation.

**Disclosure**

The authors declared no competing interest.

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