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Research Article

Anxiety and depression among students using tobacco in a selected college of Sonitpur District, Assam: A cross-sectional study

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Abstract

Introduction: Tobacco use is one of the major public health concerns around the world, accounting for many deaths and disabilities. The use of tobacco is linked to many physical and mental ailments. A large population of adolescents are enrolled in colleges and universities in India, making them a vulnerable population for the use and abuse of tobacco. **Objective:** The objective of this study is to assess the level of anxiety and symptoms of depression among college-going students who consume tobacco. **Methods:** A descriptive cross-sectional approach was selected for the study. The purposive sampling technique was used to select college students aged between 17 and 24 years, enrolled in any degree program at the selected college. General Anxiety Disorder-7 Questionnaire, Patient Health Questionnaire-9 Depression Scale, and a modified version of WHO-Global Youth Tobacco Survey Questionnaire were used to collect data. **Results:** The study findings show that tobacco use was highest among male students having a family member who uses tobacco. It was also found that the majority of the current tobacco users 43 (40.2%) had symptoms of a mild level of anxiety and 36 (33.6%) had minimal symptoms of depression. **Conclusion:** The students who are current or past tobacco users have some level of anxiety and depression. Interventions that are tailored to sensitise students about the effects of tobacco might help in reducing tobacco consumption.

Keywords: anxiety, depression, tobacco, tobacco use, young adults.

Introduction

One of the major causes of diseases and death which are preventable is the use of tobacco. It is estimated that around five million deaths occur annually because of tobacco use worldwide, of which 80% will occur in middle and low-income countries by the year 2030 (WHO, 2008). Although national and international policies such as banning public smoking, higher taxes on tobacco products, social messages about ill outcomes of tobacco are put in place, the sensitisation of its hazardous health consequences has been a relatively slow process. Worldwide, substance use among children and young adults is a major public health concern (Kumar, Shafi, & Singh, 2019). Young adults who use tobacco early in their life, increase their chance of being regular tobacco users (Alves, Precioso, & Becona, 2020).

Young adulthood, for many, is a time of physical, emotional and psychological maturation (Kumar et al., 2019), development, experimentation and risky behaviours, which make them vulnerable and at a risk for using/abusing substances (Walters, Bulmer, Troiano, Obiaka, & Bonhomme, 2018). In a survey, which included more than 4,000 children below the age of 18 years, with school-going, school dropouts and children from streets across 100 cities and towns of various states in India showed that some of the most commonly used substances are tobacco (83.2%), alcohol (67.7%), cannabis (35.4%), inhalants (34.7%),

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pharmaceutical opioids (18.1%), sedatives (7.9%) and heroin (7.9%) (Tikoo, Dhawan, Pattnayak, & Chopra, 2019). In India, it is a major concern, as it is estimated that around 55,000 children are drawn into tobacco addiction every day (Kumar et al., 2019).

The use of tobacco is usually associated with various types of cancer, cardiac diseases, diabetes, tuberculosis, and different other health problems. The results of a study done by Carceller-Maicas et al., (2014) showed that adolescents who smoke have symptoms of depression or anxiety, and they use it as self-medication for emotional distress.

Eighty per cent of the worldwide tobacco users belong to low and middle-income countries. India is the third-highest producer and second-highest consumer of tobacco and tobacco products in the world. Thus, India has one of the highest burdens of mortality and morbidity related to tobacco. The Global Adult Tobacco Survey-2 (GATS-2) 2016-2017 for India reported that the prevalence of tobacco use in any form among Indian adults aged between 15 and above is 28.6% i.e., 266.8 million individuals (Jodalli & Panchmal, 2019). According to the National Mental Health Survey (2016), in India, the prevalence of tobacco use disorders among the general population was found to be 12.5% in people of the age group 18 to 29 years. The survey also found that 20.9% of the entire Indian population have a dependent pattern of tobacco use. The majority of tobacco users start using tobacco at a very early age, with 87% starting before the age of 18 years. A study carriedout on 16,953 undergraduate students from 25 different universities across Asia, Africa, and America, reported that 13.3% of college students were tobacco users. The prevalence rate among countries, however varied, from 6.9% in India to 3.8% in Singapore, indicating that cultural and societal differences influence tobacco use. In India, the type, quantity, and age of onset of tobacco use are determined by local practices. Smoking tobacco, for example, is more accepted for males, whereas it is considered taboo for females. However, there is a higher chance of acceptance if females use a smokeless form of tobacco (Menon, George, Nair, Rani, Thennarasu, & Jaisoorya, 2020). In Assam, welcoming a guest with betel nuts and tobacco is customary, and thus, tobacco is readily available and is accepted by society. The behaviours of young adults are influenced by the immediate family, educational, and societal environment. Tobacco consumption, thus, may be influenced by culture, societal acceptance, exposure to tobacco advertisements, awareness about the effects of tobacco use, and availability of tobacco products. A study done in Mangalore by Jodalli and Panchmal (2019), to explore the tobacco use among 802 college students aged between 18 and 24 years found that there was a significant difference between gender and tobacco smoking behaviour, where 4.9% of males smoked tobacco than 0.4% females daily. The results also showed a high prevalence (40%) of males with a history of chewing tobacco thank females.

The use of tobacco products has been associated with psychological distress (Wang et al., 2018). A mixed-method year-long survey was done among 3,418 college students in Georgia, USA, aged between 18 and 25 years. Adult ADHD Self-Report Scale, Patient Health Questionnaire-9, and Zung Self-Rating Anxiety Scale were used to assess the ADHD symptoms, depression, and anxiety, respectively. Symptoms of nicotine dependence were assessed using the Hooked-on Nicotine Checklist. The results showed a higher level of depressive and anxiety symptoms among cigarette users (Bierhoff, Haardorfer, Windle, & Berg, 2019).

Research findings have shown that adolescents with symptoms of anxiety or depression were at higher risk for smoking initiation than asymptomatic adolescents. A longitudinal study aimed at examining the risk of adolescents with symptoms of anxiety and depression transitioning to daily tobacco smoking or nicotine dependence was carried out in Australia. The data were collected from 1992 to 2003 from 2032 adolescents. Clinical Interview Schedule-R was used to assess the anxiety and depression; tobacco consumption was assessed using the Fagerstrom Test for Nicotine Dependence among the participants. The results showed that the lifetime prevalence rate of smoking tobacco/cannabis was 63%, with 51% of participants initiating smoking in adolescence and 12% in young adulthood. Nicotine dependence was found among 13% of the participants. It was also found that adolescents with daily smoking habits had a high level

of symptoms of anxiety and depression and they were almost twice likely to develop nicotine dependence in young adulthood compared to adolescents with low levels of depression and anxiety (McKenzie, Olsson, Jorm, Romaniuk, & Patton, 2010).

There are lot of literature in western countries about tobacco use among adolescents and young adults. Although national surveys have been done focusing on adolescents and adults, the authors could access very few studies were done about tobacco consumption and its association with symptoms of anxiety and depression among young adults in India. Especially in the Northeastern region of India, where tobacco consumption in various forms have a cultural and customary aspect and is welcomed without any taboo attached to it, the investigators found very few studies that explore tobacco consumption among adolescents and its effect on their mental health. The results of this study could help policymakers and mental health professionals with valuable insight into the prevalence of tobacco consumption among young adults and its effect on their mental health.

Objectives

The objective of this study is to :

- assess the level of anxiety and symptoms of depression among college students who consume tobacco;
- find the association between demographic variables and tobacco consumption, with anxiety and depression.

Materials and Methods

The investigator chose a descriptive cross-sectional approach to achieve the aim of the study. The study was conducted in a selected college of Assam, India. The college has a total of 14 departments of Arts and Science, where a total of 1,600 to 1,700 students study in Degree and Higher Secondary courses. Confidentiality and anonymity of the college and students have been maintained.

The students enrolled in degree programs of the selected college, aged between 17 and 24 years, were the sample of the study. The students who were enrolled for diploma, certificate courses or the higher secondary course were excluded from the study. The sample was selected using the purposive sampling technique (complete enumeration), and the data were collected in 2014 from all the eligible students who provided their written consent and were present during the time of data collection. Permission was taken from the college administration to conduct the study.

Total degree students enrolled at the college were 790. Only 550 students in degree programs were present at the time of data collection. Questionnaires were distributed to 550 students, of which 250 students refused to participate. Only 215 questionnaires were fully filled, of which 130 participants stated using tobacco (current and past tobacco user). Thus, a total of 130 students who were consuming tobacco at the time of data collection or had a history of tobacco use were included as the study participants. The sample consisted of 34 (26.2%) students from Science, and 96 (73.8%) students from Arts.

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The researcher provided all the necessary information about the study aims and objectives before collecting data from the participants. Verbal and written consent from the students were also taken. Students were then provided with paper-and-pencil questionnaires. They were assured about the confidentiality and anonymity of their responses. A pamphlet was provided to all students with information regarding the harmful effects of tobacco use; signs and symptoms of anxiety and depression; where and how to seek help if they experience any symptoms, after completing the data collection.

Instruments and data collection

A socio-demographic proforma was used to assess the sample characteristics. The items included in the proforma were age, gender, marital status, educational level, religion, annual income of the family, type of family, stream of study, the habit of tobacco use, and any other family member using tobacco. To assess the level of anxiety and depression symptoms among the participants, the General Anxiety Disorder 7 Questionnaire (GAD-7), and Patient Health Questionnaire 9 Depression scale (PHQ-9) were used, respectively. GAD-7 had seven items, scored 0 to 3. A score of 0-4, 5-9, 10-14 or 15-21 indicates minimal, mild, moderate, or severe anxiety, respectively. The Cronbach's alpha reliability score of GAD-7 was 0.88 (Johnson, Ulvenes, Oktedalen & Hoffart, 2019). The PHQ-9 Depression scale had nine items scored 0 to 3. A score of less than 5, 5-9, 10-14, 15-19 or more than 20 indicates no depressive symptoms, minimal symptoms, minor depression, major depression moderately severe, or severe major depression, respectively. The Cronbach's reliability score of PHQ-9 was 0.86 (American Psychological Association, 2011). To assess tobacco use, a modified version of Global Adult Tobacco Survey (GATS) version 1.2 (2014) was used. The modified version was validated and approved by experts from the field of Psychiatry, Psychiatric Nursing, Psychology and Psychiatric social work. Prior permission was taken to modify and use the GATS tool. Modifications were done as the original questionnaire was long and some participants expressed difficulty in following the instruction during pilot testing. The reliability score for the modified GATS tool was determined using the test-retest method (0.8). The study participants were given all the study tools in the English language.

The questionnaires were distributed to the students in the classroom. The researcher was present at all times to provide clarification for the participant's doubts. The questionnaires were collected back the same day by the researcher.

The statistical analysis was performed with SPSS Version 16.0. Frequency and percentage were used to present the descriptive statistics. A Chi-square test was used to find the association between tobacco consumption, demographic proforma, anxiety and depression. A p-value of $< .05$ was considered significant.

Results

The analysis of data was done among 130 students who were consuming tobacco at the time of data collection or had a history of tobacco use.

Description of demographic variables of all tobacco users

The findings of the study showed that most students using tobacco were Hindu (89.2%) male (69.2%) in the age group of 19 to 20 years (43.8%) studying in arts stream (73.8%), from a rural background (73.8%), nuclear family (53.1%), with a monthly family income of more than 10,000 INR (48.5%), having a family member who uses tobacco (72.3%). The data also showed that the majority of the current tobacco consumer (82%) used tobacco in smokeless form (46.9%). Table 1 shows the frequency and percentage distribution of the sample characteristics.

Table 1

Frequency and Percentage Distribution of Sample Characteristics

N = 130

Variable	Frequency (*f*)	Percentage *(%)*
Age in years		
17-18	26	20.0
19-20	57	43.8
21-22	37	28.5
23-24	10	7.7
Gender		
Male	90	69.2
Female	40	30.8
Marital status		
Married	10	7.7
Single	120	92.3
Religion		
Hindu	116	89.2
Muslim	10	7.7
Christian	4	3.1
Stream of study		
Science	34	26.2
Arts	96	73.8
Type of family		
Nuclear	69	53.1

Table 1 cont...
Frequency and Percentage Distribution of Sample Characteristics

Variable	Frequency (*f*)	Percentage (%)
Joint	61	46.9
Background		
Rural	96	73.8
Urban	11	8.5
Semi-urban	23	17.7
Monthly family income (in Rupees ₹)		
2,001-5,000	6	4.6
5,001-10,000	61	46.9
>10000	63	48.5
Habit		
Current Exclusive Smoking	14	10.8
Current Exclusive Chewing tobacco	61	46.9
Current Both forms of tobacco user	32	24.6
Past user	23	17.7
Family member using tobacco		
Yes	94	72.3
No	36	27.7

A pattern of tobacco use

The majority of the current tobacco users consume smokeless forms of tobacco (46.9%). Betel quid with tobacco (16.3%), shikhar (10.9%), zarda (18.5%), gutka (5.4%), and chewing tobacco (5.4%), are the smokeless tobacco products used by the sample, where a majority (43.5%) consumes multiple smokeless tobacco products in their daily lives. Among the sample who uses tobacco in smoking form, the majority 31 (67.4%) consumes cigarette, 3 (6.5%) uses bidi, and 12 (26.1%) consumes both. The reasons for consuming any form of tobacco varies from one individual to another. The majority 43 (32.3%) of the tobacco users gave multiple reasons for consuming tobacco. Feeling anxious (13.1%), feeling sad (7.7%), to help in concentration (13.1%), peer pressure (20%), to feel attractive (1.5%), and as a tradition/ custom (11.5%). Most of the tobacco users (53.1%) started taking tobacco at the age of 13 to 16 years out of curiosity (46.9%), peer pressure (30.8%), and tradition (15.4%), and at the time of data collection, they consume tobacco at-least 10 to 19 days in a month (27.7%), the preferred place for consuming tobacco being at a friend's place (45.5%), social events (7.7%) and outside college premises (6.2%). The majority (45.4%) of the tobacco users expressed that they would quit tobacco within the next year, whereas 16.9% were ambiguous about their plan of quitting tobacco.

Description of symptoms of anxiety and depression level among current and past tobacco users

Table 2 shows the percentage distribution of symptoms of anxiety and depression among current and past tobacco users. The majority of the current tobacco users 43 (40.2%) had symptoms of a mild level of anxiety, 22 (20.6%) of them had symptoms of moderate level of anxiety, and 42 (39.3%) of the current tobacco users had no symptoms of anxiety. The findings of the study also showed that 36 (33.6%) of the current tobacco users had minimal symptoms of depression. The data from the study also shows that 8 (34.8%) and 10 (43.5%) of the 23 past tobacco users had symptoms of a mild level of anxiety and depression respectively.

Table 2
Percentage Distribution of Level of Anxiety and Depression Symptoms among Tobacco Users

N = 130

Status of tobacco use	Variables	Frequency (*f*)	Percentage (%)
Current tobacco users (n = 107)	Level of anxiety		
	<5 (No anxiety)	42	39.3
	5-9 (Mild anxiety)	43	40.2
	10-14 (Moderate anxiety)	22	20.6
	Level of depression		
	<5 (No symptoms of depression)	62	57.9
	5-9 (Minimal symptoms of depression)	36	33.6
	10-14 (Minor depression)	9	8.4

Table 2 cont...

Percentage Distribution of Level of Anxiety and Depression Symptoms among Tobacco Users

Status of tobacco use	Variables	Frequency (*f*)	Percentage (%)
Past tobacco users (n = 23)	Level of anxiety		
	<5 (No anxiety)	15	65.2
	5-9 (Mild anxiety)	8	34.8
	Level of depression		
	<5 (No symptoms of depression)	13	56.5

Association of demographic variables with symptoms of anxiety and depression among tobacco users

The findings from the current study show that there is an association between gender ($\chi^2 = 10.501$, $p < .005$) and habit of tobacco use ($\chi^2 = 5.184$, $p < .005$) with the level of symptoms of anxiety respectively, at .05 level of significance. The data also show that the type of family ($\chi^2 = 6.546$, $p = .01$) was independently associated with symptoms of depression among students who were current and past tobacco users. The study result did not find a significant association between symptoms of anxiety or depression with any other demographic variables.

Discussion

The study aimed at finding the level of anxiety and depression among college students who are current or past tobacco users. Anxiety disorders have been recognised as one of the most common mental illness diagnoses around the world and are associated with a significant decline in quality of life and health. Especially anxiety disorders have been reported to be associated with increased consumption of cigarettes and a lower rate of cessation (Lawrence, Considine, Mitrou & Zubrick, 2010). Findings of the current cross-sectional study reveal that the majority of current users of tobacco had a mild level of anxiety, and 20.6% of the current tobacco users had a moderate level of anxiety. It is also found that the majority (65.2%) of past tobacco users had no anxiety, whereas 34.8% of past tobacco users had a mild level of anxiety. A systematic review done by Moylan, Jacka, Pasco & Berk (2012), found that nicotine dependence and cigarette smoking are risk factors for the development of anxiety disorders. It was also reported that the use of tobacco had increased among samples with anxiety disorders. Cougle, Zvolenskym, Fitch, & Sachs-Ericsson (2010) also found an association between lifetime smoking behaviour, nicotine dependence and smoking cessation failure with anxiety disorder.

The current study found no association between age ($\chi^2 = 0.35$), marital status ($\chi^2 = 1.14$), religion ($\chi^2 = 1.12$), stream of study ($\chi^2 = 0.13$), background ($\chi^2 = 0.13$), monthly income of the family ($\chi^2 = 0.53$), and other family member using tobacco ($\chi^2 = 0.09$), with the anxiety level among all tobacco users (which includes the past as well as current tobacco users). Findings from the current study show an absence of symptoms of depression among the majority of the current and past tobacco users, whereas 33.6% of the current tobacco users and 43.5% of past tobacco users had minimal symptoms of depression. In a large-scale study done by King, Reboussin, Spangler, Ross, Sutfin (2018), among 2,370 students, depression was one of the most frequently reported mental illnesses with a history of cigarette smoking. They also found that the students reporting more than two mental health diagnoses were using cigarettes and other tobacco products. In another study done in Nepal (Gautam et al., 2021), the findings show that students who were using tobacco were 14 times more likely to report symptoms of depression than their counterparts who do not or have never used tobacco. The current study findings of depression among tobacco users are similar to a large-scale survey done among 13,827 teenagers of 12 to 17 years, in the USA (Martini, Wagner & Anthony, 2002), where it was also found that teenagers who were current tobacco users had higher levels of depression as compared to past tobacco users or never users. However, depression was not found to be statistically significant with the habit of tobacco use in the current study, which is a similar result from the study done by Carceller-Maicas et al., (2014).

Adolescence is a time for exploring the environment and establishing one's identity. Findings from the

current study also revealed that the majority (46.9%) of all tobacco users started using tobacco out of curiosity, followed by peer pressure (30.8%) and tradition (15.4%). In a longitudinal study (Pierce, Distefan, Kaplan & Gilpin, 2005), the adolescents who never smoked were re-interviewed three years after they participated in a tobacco survey in California. The results from the study showed that curiosity and susceptibility to tobacco smoke were independently associated with higher chances of smoking in adolescents who never smoked tobacco. The results from a survey study where 312 college students participated, indicated that students would most likely indulge in behaviours that put their health at risk when they are accompanied by a peer or friend (Varela & Pritchard, 2018).

The study limitations include a small sample size which was limited to only one college in Assam, and self-reported data of tobacco use, anxiety and depression. Also, a cross-sectional study design did not allow to make definitive conclusions from the study findings. Further, elaborate, large scale studies are required to make a strong conclusion on the association between study variables. The study participants of the current study were provided with details of the nearest de-addiction centres and mental health hospitals where they could find support and professional help.

Conclusion

The findings from the study suggest that a combination of mental health services and substance use/abuse awareness is relevant to enhancing the physical and mental health of the students. Even though approaches such as Smoke-Free Campus and No Tobacco Zone are placed in many universities and college campuses, a more tailored intervention to increase the awareness about tobacco effects and mental health could yield better outcomes.

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