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Impact of Smoking on Mental Illness

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Abstract **Original Research Article**

Background: Tobacco use is a major health risk linked to chronic diseases like COPD, stroke, coronary heart disease, and lung cancer, as well as mental health issues such as anxiety, depression, and ADHD. Smokers with mental illnesses have a significantly higher prevalence, with conditions like schizophrenia and bipolar disorder showing elevated smoking rates. The relationship between smoking and mental health is complex, as smoking both alleviates and worsens mental health, necessitating targeted intervention strategies. ***Aim of the study:*** This study aims to investigate the impact of smoking on mental illness, focusing on its effects on the prevalence, severity, and progression of psychiatric disorders. ***Methods:*** This cross-sectional observational study, conducted at the Department of Psychiatry, Medical College for Womens and Hospital, Dhaka, Bangladesh from January 2024 to December 2024, aimed to assess the impact of smoking on mental health disorders. A total of 110 participants, 55 smokers and 55 non-smokers, were included. Inclusion criteria were adults aged 18–50 years with no severe physical illnesses or major cognitive impairments. Exclusion criteria included substance abuse or unrelated psychiatric disorders. Demographic data were collected via a structured questionnaire. Mental health outcomes were assessed using the Perceived Stress Scale, Generalized Anxiety Disorder Scale, Depression Severity Index, and Quality of Life Score. Data analysis was performed using SPSS software. ***Result:*** The study found no significant differences in age and BMI between smokers and non-smokers (p=0.301, p=0.089). However, smokers had a higher proportion of males (78.18%) and were more likely to have primary education (54.55%) and be separated/divorced/widowed (45.45%). Smokers showed higher rates of depression (45.45% vs. 20.00%, OR: 2.12), anxiety (38.18% vs 14.55%, OR: 2.30), insomnia (27.27% vs 9.09%, OR: 2.37), and substance use disorder (23.64% vs 5.45%, OR: 4.83), with significant differences. Smoking was a strong predictor of mental health disorders (OR: 2.50, p<0.001). ***Conclusion:*** This study demonstrates the strong link between smoking and mental health issues, showing higher rates of depression, anxiety, insomnia, and substance use disorders among smokers. Smoking is a key predictor of mental health problems, with a bidirectional relationship that worsens both psychological conditions and smoking-related health issues.

Keywords: Smoking, Psychiatric Disorder and Mental Illness.

INTRODUCTION

Tobacco use is a significant health risk, contributing to various physical and psychological conditions [1]. Smoking is biologically linked to chronic diseases such as chronic obstructive pulmonary disease (COPD), stroke, coronary heart disease, and lung cancer. Additionally, it correlates with declines in overall health, impairments in mental and physical well-being, and limitations in daily activities [2]. Importantly, recent studies highlight a strong association between smoking and psychological conditions such as anxiety, depression, and attention-deficit hyperactivity disorder (ADHD) [3]. In Bangladesh, the prevalence of smoking remains alarmingly high, with approximately 23% of the population using tobacco products [4]. Among Bangladeshi men, smoking rates are reported to be around 60% [5]. Factors contributing to this high prevalence include the affordability of tobacco products, weak regulatory enforcement, and easy accessibility, particularly among young adults and university students [6]. Notably, teenagers and undergraduate students are at increased risk due to peer influence and the symbolic perception of smoking as a sign of adulthood [7]. This risk is exacerbated by the transition from non-smoking to regular smoking habits during academic tenure, family issues or other various reasons [8]. Internationally, smoking rates in individuals with mental illnesses are significantly higher compared to the general population.

Individuals with mental illnesses experience a disproportionate burden of smoking-related diseases, with a reduced life expectancy of 14 to 25 years [9]. Severe mental illnesses, including depression and bipolar disorder, are particularly linked to higher smoking rates [10]. Up to 60% of adults with schizophrenia and 45% of those with bipolar disorder are current smokers - rates significantly higher than in the general population [11,12]. Additionally, smoking among individuals with SMI has been associated with reduced medication effectiveness, increased mental illness relapse rates, and higher hospitalization rates [13]. The relationship between smoking and mental illness is complex and multifaceted. Poor mental and physical health may lead individuals to use smoking as a form of self-medication, as nicotine impacts neurotransmitters like serotonin and dopamine, providing temporary relief from anxiety and depression [14]. However, smoking also negatively affects mental health through these same neurotransmitter pathways, with cigarettes containing harmful chemicals that exacerbate overall health deterioration [15]. This bidirectional relationship underscores the difficulty in establishing causality between smoking and mental health issues [16]. Given the significant health burden associated with smoking in individuals with mental illness, there is an urgent need for research to develop effective intervention strategies. This study aims to investigate the impact of smoking on mental illness, focusing on its effects on the prevalence, severity, and progression of psychiatric disorders.

METHODOLOGY & MATERIALS

This was a cross-sectional, observational study conducted to examine the impact of smoking on mental health disorders at the Department of Psychiatry, Medical College for Womens and Hospital, Dhaka, Bangladesh from January 2024 to December 2024. A total of 110 participants were included in the study, divided into two groups: 55 smokers and 55 non-smokers. Smokers were defined as individuals who consumed at least one cigarette per day for the last six months. Non-smokers were individuals who had never smoked or had quit smoking for at least one year.

- **Inclusion Criteria:** Inclusion criteria for both groups were as follows: adults aged 18–50 years, no history of severe physical illnesses (e.g., cancer, severe cardiovascular disease), and no major cognitive impairments.

- **Exclusion Criteria:** Exclusion criteria included individuals with a history of substance abuse other than tobacco or those with major psychiatric disorders unrelated to smoking.

Demographic and clinical data were collected through a structured questionnaire. Participants provided details on their age, gender, BMI, marital status, educational level, and occupation. Smoking status was self-reported, with smokers indicating the average number of cigarettes they smoked per day.

To assess mental health outcomes, participants completed the following standardized psychological assessments:

- **Perceived Stress Scale (PSS):** A 10-item scale designed to measure the perception of stress in everyday life [17].
- **Generalized Anxiety Disorder Scale (GAD):** A 7-item scale assessing symptoms of generalized anxiety [18].
- **Depression Severity Index (DSI):** A 9-item scale evaluating the severity of depressive symptoms [19].
- **Quality of Life (QoL) Score:** A 10-item measure of overall life satisfaction and well-being [20].

Statistical Analysis

Statistical analyses were conducted using SPSS software (version 26). Categorical variables were presented as frequencies and percentages and continuous variables were expressed as means ± standard deviations (SD). Results were expressed as odds ratios (OR) with 95% confidence intervals (CI). A p-value of ≤ 0.05 was considered statistically significant.

RESULT

The mean age and BMI of smokers and non-smokers were comparable, with no significant differences (p=0.301 and p=0.089, respectively). Among smokers, a higher proportion were male (78.18%) compared to non-smokers (61.82%). Educational level varied significantly (p=0.015), with smokers more likely to have primary education (54.55%) and less likely to have secondary education (0%) compared to non-smokers. Marital status also showed a significant difference (p=0.045), as a higher proportion of smokers were separated/divorced/widowed (45.45%) than non-smokers (34.55%). Regarding employment, smokers had a slightly higher employment rate (32.73%) in comparison to non-smokers (27.27%), but most participants in both groups were unemployed (p=0.015) (Table 1). The distribution of the average number of cigarettes smoked per day among participants revealed that the largest proportion (42%) smoked 4–8 cigarettes daily, followed by 27% who smoked 8–12 cigarettes. Smaller percentages smoked 1–4 cigarettes (18%), 12–16 cigarettes (9%), and more than 16 cigarettes (4%) (Figure 1). Smokers had a greater likelihood of depression (45.45% vs. 20.00%, OR: 2.12, p<0.001), anxiety (38.18% vs. 14.55%, OR: 2.30), insomnia (27.27% vs. 9.09%, OR: 2.37), and substance use disorder (23.64% vs. 5.45%, OR: 4.83), where all differences were statistically significant (Table 2). The Perceived Stress Scale (PSS) score was notably higher in smokers (25.3±6.2) than in non-smokers (18.7±4.8, p < 0.001). Smokers also had higher General Anxiety (12.5±4.0 vs. 8.4±3.2) and Depression Severity Index

scores (14.2±5.6 vs. 9.1±4.1). Additionally, smokers had a lower Quality of Life (QoL) score (58.1±12.5 vs. 72.8±10.3) (Table 3). Smoking was the strongest predictor (OR: 2.50, 95% CI: 1.80–3.40, p < 0.001) after age (OR: 1.35, 95% CI: 1.15–1.60, p = 0.001). Lower education level (OR: 1.75, 95% CI: 1.20–2.50, p=0.005) and low income (OR: 1.50, 95% CI: 1.10–2.10, p=0.014) were also significant predictors. Marital status showed a protective effect (OR: 0.75, 95% CI: 0.60–0.95, p=0.015), with married individuals less likely to experience mental health disorders (Table 4).

Table 1: Socio-demographic characteristics of the participants (N=110)

Characteristics	Smokers (n=55)		Non-Smokers (n=55)		p-value
	n	%	n	%	
Age (in years)					
Mean ± SD	34.5 ± 8.2		33.8 ± 7.9		0.301
BMI (kg/m2)					
Mean ± SD	24.45 ± 2.36		23.96 ± 2.62		0.089
Gender					
Male	43	78.18	34	61.82	0.649
Female	12	21.82	21	38.18	
Educational level					
No formal education	6	10.91	5	9.09	0.015
Primary education	30	54.55	16	29.09	
Secondary education		0.00	25	45.45	
Higher/more than secondary	10	18.18	9	16.36	
Marital status					
Married	23	41.82	22	40.00	0.045
Separated/Divorced/widowed	25	45.45	19	34.55	
Never married	7	12.73	14	25.45	
Occupation					
Employed	18	32.73	15	27.27	0.015
Unemployed	37	67.27	40	72.73	

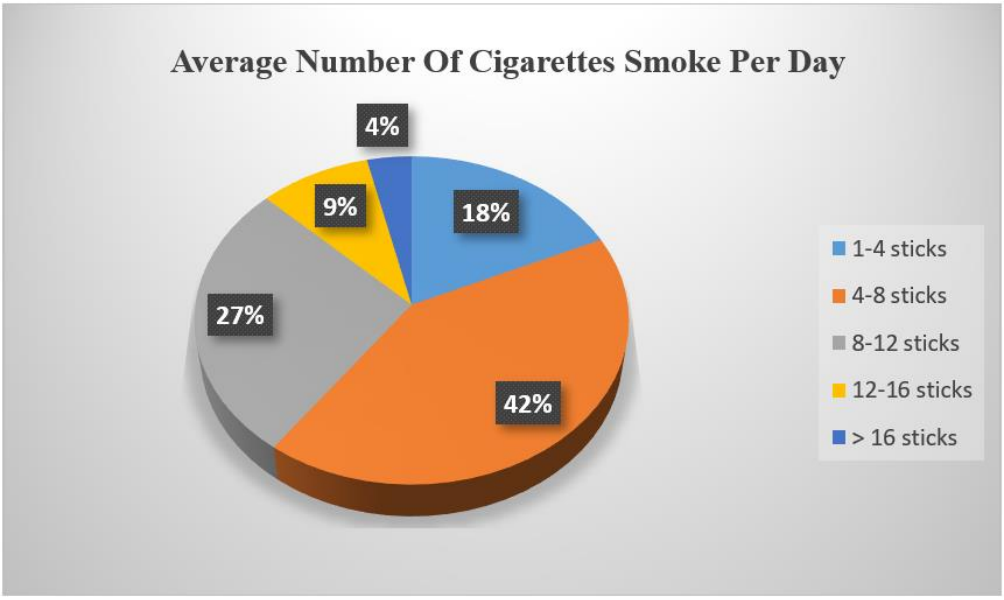

Figure 1: The average number of cigarettes smoked per day

Table 2: Prevalence of Mental Health Disorders in Smokers vs. Non-Smokers

Disorder	Smokers		Non-Smokers		Odds Ratio (95% CI)	p-value
	n	%	n	%		
Depression	25	45.45	11	20.00	2.12 (1.55–2.85)	<0.001
Anxiety	21	38.18	8	14.55	2.30 (1.70–3.40)	
Insomnia	15	27.27	5	9.09	2.37 (1.50–3.70)	
Substance Use Disorder	13	23.64	3	5.45	4.83 (2.80–8.30)	

Table 3: Comparison of Psychological Scores between Smokers and Non-Smokers

Psychological Measure	Smokers	Non-Smokers	p-value
	Mean ± SD	Mean ± SD	
Perceived Stress Scale (PSS)	25.3 ± 6.2	18.7 ± 4.8	<0.001
General Anxiety Score (GAD)	12.5 ± 4.0	8.4 ± 3.2	
Depression Severity Index	14.2 ± 5.6	9.1 ± 4.1	
Quality of Life (QoL) Score	58.1 ± 12.5	72.8 ± 10.3	

Table 4: Key Predictors of Mental Health Disorders: Simplified Logistic Regression

Variable	Odds Ratio (95% CI)	P-value
Smoking (Yes/No)	2.50 (1.80–3.40)	<0.001
Age	1.35 (1.15–1.60)	0.001
Marital Status	0.75 (0.60–0.95)	0.015
Education Level (Low)	1.75 (1.20–2.50)	0.005
Income (Low)	1.50 (1.10–2.10)	0.014

DISCUSSION

Smoking is a pervasive public health issue with far-reaching consequences beyond its well-documented physical effects [21]. Emerging evidence highlights a strong link between smoking and mental health disorders, including depression, anxiety, insomnia, and substance use disorders [22]. Nicotine, the primary psychoactive component in tobacco, can alter brain chemistry, impacting mood regulation and stress responses. Furthermore, the bidirectional relationship between smoking and mental illness creates a cycle where smoking may exacerbate psychological symptoms and mental health conditions may increase the likelihood of smoking [23]. Understanding this complex interplay is essential for designing effective interventions to address both smoking cessation and mental health management. In this study, we explored the intricate relationship between smoking and mental illness, a topic of increasing relevance in public health. In our study, we observed no significant difference in age, gender, or BMI between smokers and non-smokers, as indicated by the p-values of 0.301, 0.649, and 0.089, respectively. However, the differences in educational level and marital status between smokers and non-smokers were statistically significant (p-values of 0.015 and 0.045, respectively). A higher percentage of smokers had lower levels of education, which aligns with previous research that links lower educational attainment with higher smoking rates [24]. Furthermore, smokers in our study were more likely to be separated, divorced, or widowed, which is consistent with findings from studies that suggest individuals with disrupted marital relationships are at higher risk for smoking [25]. Additionally, the number of cigarettes smoked per day varied significantly among smokers, with the majority consuming between 4 and 8 sticks daily (41.82%). This result is consistent with studies indicating that moderate to heavy smoking is prevalent in populations with mental health challenges [26]. Our study revealed that smokers had a significantly higher prevalence of depression (45.45% vs. 20.00%), anxiety (38.18% vs. 14.55%), insomnia (27.27% vs. 9.09%), and substance use disorders (23.64% vs. 5.45%) compared to non-smokers. The odds ratios for these disorders were consistently elevated, with smoking being associated with a higher likelihood of experiencing these mental health conditions. For instance, smokers were more than twice as likely to suffer from depression (OR=2.12, p<0.001) and anxiety (OR=2.30, p<0.001), as compared to non-smokers. These findings align with several studies that have demonstrated a strong association between smoking and psychiatric disorders [23,24]. In particular, our study's finding of a high prevalence of substance use disorder among smokers (OR = 4.83, p<0.001) supports the theory that smoking may act as both a precursor and a co-occurring disorder with substance use issues [29]. Psychological measures further emphasized the mental health burden among smokers. As shown in Table 3, smokers had significantly higher scores on the Perceived Stress Scale (PSS) and Generalized Anxiety Disorder (GAD) scale, indicating a greater level of stress and anxiety. The Perceived Stress Scale in smokers had a mean score of 25.3±6.2 compared to 18.7±4.8 in non-smokers (p<0.001). A study by Lawless *et al.*, (2015) reported that smokers exhibit elevated stress levels, hypothesizing that nicotine dependency exacerbates stress reactivity and coping difficulties [30]. Furthermore, chronic smoking may impair the hypothalamic-pituitary-adrenal (HPA) axis, contributing to heightened stress sensitivity [31]. Similarly, the General Anxiety Score was also higher in smokers (12.5±4.0 vs. 8.4±3.2, p<0.001), further supporting the hypothesis that smoking contributes to psychological distress. In contrast, non-smokers had better scores on the Quality of Life (QoL) scale (72.8±10.3 vs. 58.1±12.5, p<0.001), suggesting that smoking adversely affects overall well-being. Furthermore, the simplified logistic regression analysis presented in Table 4 highlights smoking as a strong predictor of mental health disorders, with an odds ratio of 2.50 (95% CI: 1.80–3.40), confirming the robust link between smoking and mental illness. This is consistent with studies that suggest smoking not only directly impacts mental health but also interacts with other

sociodemographic factors, such as age, marital status, education level, and income, which were also identified as significant predictors in our study [32]. Specifically, younger individuals, those with lower education levels, and those from lower-income groups were more likely to experience mental health disorders, as reflected in the odds ratios for these variables [33].

Limitations of the study: This study has several limitations. The study's sample size of 110 participants, though reasonable, may not fully represent the broader population, particularly given the higher prevalence of smoking in specific subgroups like young adults and university students. Furthermore, excluding individuals with major psychiatric disorders unrelated to smoking could reduce the generalizability of the findings to all individuals with mental health issues.

CONCLUSION

In conclusion, this study underscores the significant association between smoking and mental health disorders, including depression, anxiety, insomnia, and substance use disorders. Smokers were found to have higher levels of psychological distress, as evidenced by elevated Perceived Stress and Generalized Anxiety Disorder scores, as well as lower Quality of Life ratings. Smoking emerged as a strong predictor of mental health issues, with odds ratios confirming its adverse impact on mental well-being.

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