

# Unraveling the Social Consequences of Tobacco Products on Health and Environment: A Case Study in Gopalganj District, Bangladesh

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## Abstract

The use of tobacco has been associated with numerous detrimental health outcomes, including lung cancer, heart disease, stroke, and respiratory disorders like chronic obstructive pulmonary disease (COPD). This study aimed to investigate the effects of tobacco toxicants on human health and their implications for environmental pollution in Gopalganj Sadar. A structured questionnaire was employed to conduct face-to-face interviews with respondents, evaluating their knowledge regarding the toxic content of tobacco and the associated health and environmental hazards. The study revealed that approximately 80% of respondents used smoking tobacco products, while only 8% preferred smokeless tobacco and 12% used both types. Alarming, a significant proportion (68%) of smokers-initiated tobacco use during adolescence (between 15 and 24 years old), suggesting that young smokers are particularly vulnerable to the health consequences of tobacco consumption. The survey unveiled that tobacco users suffer from a range of acute and chronic diseases, with hypertension being the most prevalent among respondents (31%), followed by COPD/Asthma (23%), while cancer cases were relatively low (0%). Surprisingly, most respondents lacked awareness of the toxicants present in tobacco products, although 92% of tobacco users acknowledged the link between tobacco use and environmental pollution. These findings underscore the inadequate awareness among respondents regarding the health risks associated with tobacco toxicants and their contribution to environmental pollution. Consequently, there is a crucial need to strengthen existing policies to address these adverse effects and promote public health. By bridging the knowledge gap and heightening awareness, policymakers can work towards implementing more effective strategies to curb tobacco usage and safeguard human health and the environment.

**Keywords:** Tobacco products, Human health, Environmental pollution, Health impact.

## 1. Introduction

Tobacco products cause numerous health issues, including lung cancer, heart disease, stroke, and respiratory disorders. They also contain poisonous substances that pollute the environment. Tobacco is the second leading cause of death worldwide, with high rates of young people smoking, including non-cigarette products. In Bangladesh, smoking and passive smoking are major avoidable causes of death, with significant financial impacts on the community (The Daily Star, 2016). Bangladesh has a high number of adults consuming tobacco, with increasing numbers of smokers. The Global Youth Tobacco Survey shows that over 57,000 people die annually from tobacco-related diseases, with 1.2 million sickness incidents and 380,000 impairments linked to cigarette use. With 41.3 million individuals using both smoked and smokeless forms, tobacco-related illnesses and health hazards are increasing among the general population [1]. Bangladesh produces 1.3% of the world's tobacco, posing a

significant threat to its society, economy, and ecology. The country's food security is threatened by the exploitation of arable land for tobacco production. Tobacco waste, including cigarette litter, is a major environmental concern worldwide due to the harmful chemicals and heavy metals found in tar. Cigarette filters contain tar, which can cause illnesses like cancer, cardiovascular disease, and lung inflammation (Qamar et al., 2019). When a cigarette is burned, some hazardous metals are released into the smoke. These metals build up in the body's various organs, including the blood, kidneys, bones, brain, respiratory system, and lungs. This causes diseases, and the metals also pollute the environment (Mondol, et al., 2020).

The study was designed to learn more about the patterns of tobacco use, with a focus on identifying the sociodemographic categories more likely to smoke and the effects that smoking has on persons living in the study area of Gopalganj Sadar. In order

to safeguard people against the destructive effects of tobacco use, it may also be helpful to develop an effective awareness campaign to discourage tobacco use. The purpose of the study is to describe the negative consequences of tobacco toxicants on human health, the environment, and smokers' awareness of these impacts.

### 1.1 Justification of the Study

Tobacco is a major cause of preventable deaths and is associated with health problems like cancer, and respiratory, and cardiovascular disease. Research in Gopalganj Sadar can inform public health policies and interventions to reduce tobacco-related morbidity and mortality. The study aims to increase public awareness and close knowledge gaps, educating local

populations about the harm caused by tobacco to the ecosystem.

### Objectives of the Study

Examining tobacco toxicants' impact on health and environmental pollution, and assessing users' knowledge of toxic components.

## 2. Materials and Methods

### 2.1 Study Area

Gopalganj Sadar is a sub-district in Bangladesh's Gopalganj district, situated in the southern part of the country. It is part of the seven upazilas and has a population of 85,398 with a literacy rate of 75.1%. The town has 51,630 households and covers an area of 391.35 km<sup>2</sup> (Figure 1).

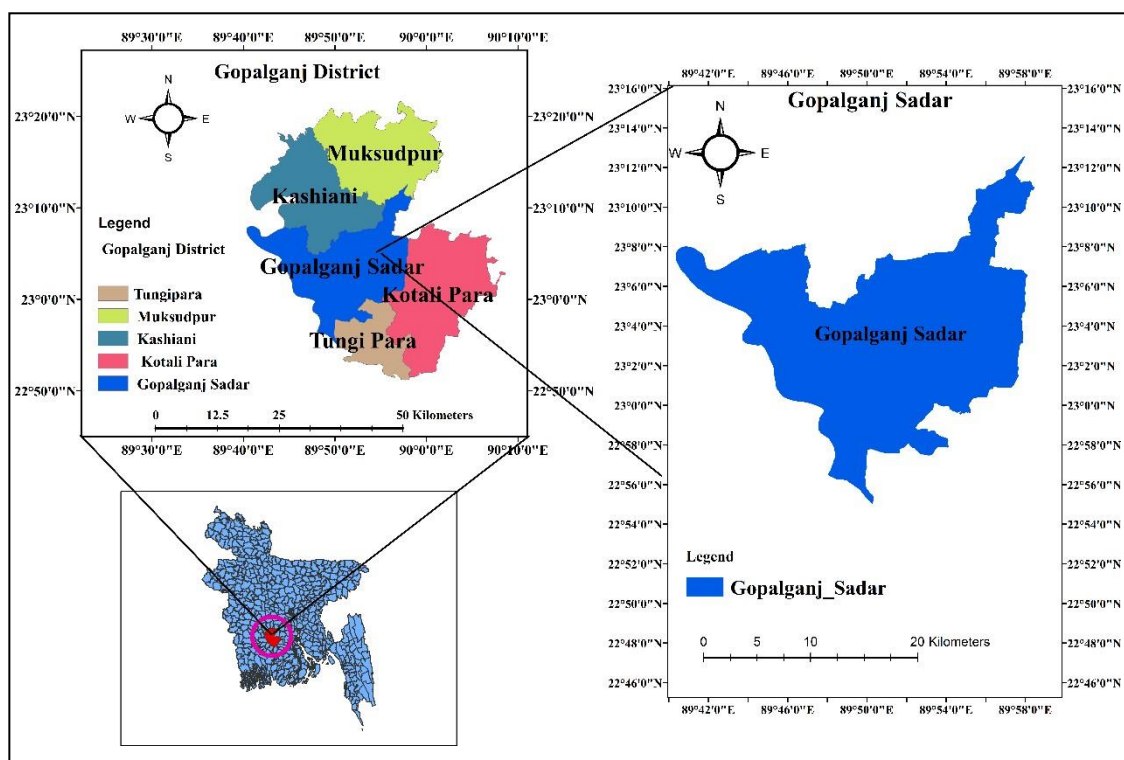


Figure 1: Geographical location of Gopalganj Sadar.

## 2.2 Methods of the Study

**2.2.1 Research design:** The research utilized primary and secondary sources, including field observations, interviews, and questionnaire surveys. The questionnaire was created for the chosen community to assess the impact of different tobacco products on human health and environmental damage. The pre-tested version was modified as needed before finalization. Primary data was gathered from the surveys conducted in the chosen areas.

**2.2.2 Data collection:** Data was collected from the sample group. The respondents served as the sampling group. The respondents (both male and female) over the age of 20 were chosen as the primary respondent group since they were more aware of the study area and its subject. Self-observation was used to gather some data in order to understand the study area's true situation.

**2.2.3 Data analysis:** Data processing attempts were conducted once data from primary and secondary sources had been collected. After being sorted, the information and data were classified and interpreted in accordance with the goals, and analysis was carried out using a variety of analytical techniques and computer programs (Statistical Package for the Social Sciences-SPSS. Microsoft Excel 2021). The data were analyzed using a suitable analytical model and statistical methods.

## 3. Results and Discussion

### 3.1 Basic Information of Responders

In the survey area, the characteristics of the respondents by the survey method were the age, gender, educational background, religious and marital status of respondents. The survey was conducted among 50 respondents (Table 1).

Characteristics	Ranges	Frequency	Percentage	Total
Age Group	20-25	21	42.0	50
	26-35	17	34.0	
	36-45	8	16.0	
	46-55	4	8.0	
Gender	Male	43	86.0	50
	Female	7	14.0	
Education	Illiterate	7	14.0	50
	Literate (Signature only)	5	10.0	
	Primary	6	12.0	
	SSC	5	10.0	
	HSC	9	18.0	
	Above Honors/Degree	18	36.0	
Religious Status	Muslim	44	88.0	50
	Hindu	6	12.0	
	Buddhist	0	0	
	Christian	0	0	
Marital Status	Single	19	38.0	50
	Living with Partner	31	62.0	
	Separated	0	0	
	Divorced	0	0	
	Widow	0	0	

**Table 1:** Age group, gender, educational qualification, religious and marital status of the respondents.

Table (1) shows the socio-demographic status of respondents in Gopalganj Sadar, Bangladesh, ranging from 20 to 55 years old. The survey included male (86%) and female (14%) respondents. Education levels were divided into illiterate, literate (signature

only), primary, SSC, HSC, and above Honors/Degree. The majority of respondents were Muslim (88%), with Hindu (12%) respondents. The majority of respondents lived with their partner, while 38% were single.

### 3.1.1 Occupation of the respondents:

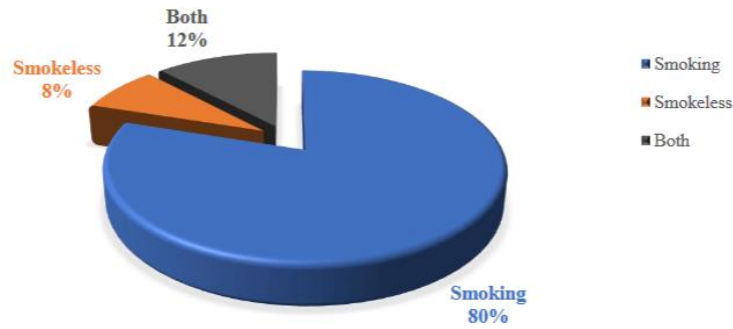
Occupation Name	Frequency	Percentage	Total
Student	14	28.0	50
General employee	23	46.0	
Entrepreneur	7	14.0	
Government employee	4	8.0	
Housewife	2	4.0	

**Table 2:** Occupation pattern of the respondents

The survey categorized respondents into general employees, students, entrepreneurs, government employees, and housewives.

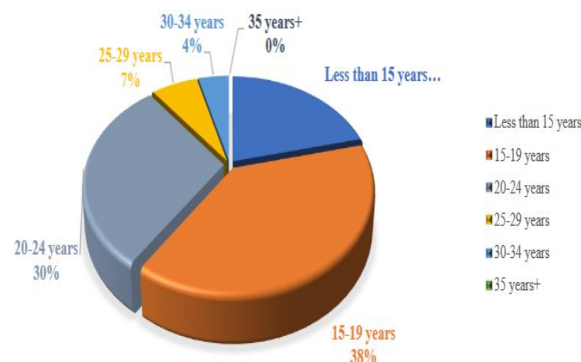
## 3.2 Tobacco Use

**3.2.1 Socio-demographic condition of tobacco products user type:** The majority of respondents take various kinds of tobacco. These tobacco products include smoking and smokeless tobacco. Around 80% of respondents used tobacco products for smoking, 8% used smokeless tobacco, and only 12% used both of them (Figure 2).



**Figure 2:** Showing the distribution of the types of tobacco used by respondents of the study area.

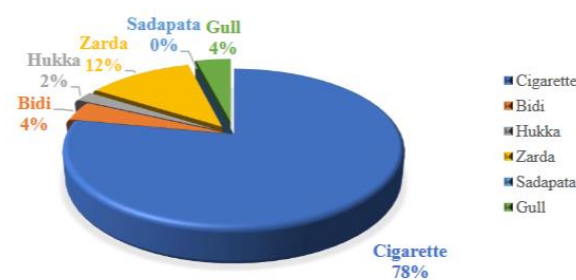
**3.2.2 Starting age of tobacco use:** Figure 3 shows that teenage tobacco users typically start using between 15-24, with 68% starting between 15-24, 4% between 30-35, and 21% under 15.



**Figure 3:** Showing the distribution of tobacco users based on the starting age group.

Most adolescents (86.79%) and drivers (53.8%) started smoking before age 15, similar to Khan et al. (2018) and Goon et al. (2014).

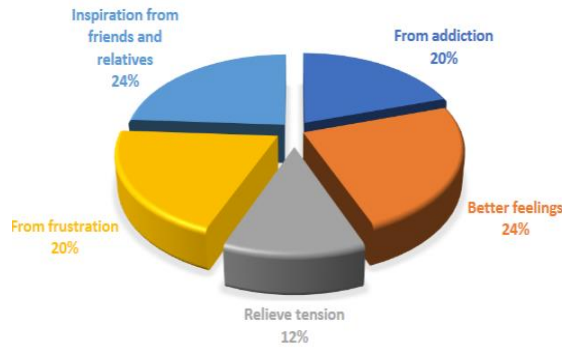
**3.2.3 Kinds of tobacco uses:** Respondents mostly use smoking tobacco, with 78% using cigarettes, while 6% use Bidi and Hukka. Zarda and Gull are less popular, with a majority of female smokers (Figure 4).



**Figure 4:** Showing the range of tobacco users' tobacco use.

Debnath et al. [2] found that respondents smoked cigarettes, bidis, hookah, and overall, 1.65%. GATS [3] reported 18.0% of adults, 36.2% of men, and 0.8% of women were active smokers. Al-Ghanem et al. [4] found that 70% of tobacco users smoked cigarettes, followed by water pipes and cigars. The majority preferred cigarettes over other items.

**3.2.4 Causes of tobacco use:** Tobacco use is primarily driven by various factors, with 24% using it for better feelings, 24% for friends' inspiration, 20% for addiction, 20% for frustration, and 12% for tension relief (Figure 5).



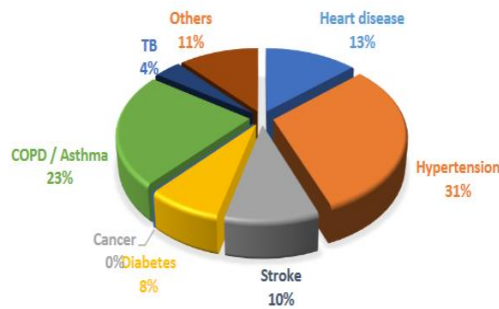
**Figure 5:** Causes of tobacco use.

The majority of respondents (29.92%) consumed tobacco due to addiction, pleasure, friends, liking, and overcoming tension or boredom. In India, addiction (31.1%), pleasure (18.8%), friends (18.8%), likings (12.5%), and overcoming tension or boredom (12.5%) influenced tobacco consumption. In Bangladesh, people initiated smoking due to peer pressure (40.7%), imitation (37.3%), to relieve tension (7.6%), and without reason (14.4%).

The main causes of tobacco use among respondents were addiction and peer pressure or tension.

### 3.3 Impact of Tobacco Toxicants on Human Health

Young smokers' health is significantly impacted by tobacco products, with 31% experiencing hypertension, COPD/Asthma, cancer, heart, stroke, diabetes, TB, and other diseases (Figure 6).



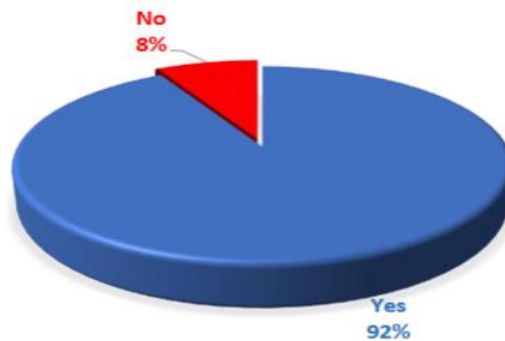
**Figure 6:** Information about suffering from multiple diseases among tobacco users.

Goon et al. [5] found that most drivers suffer from various illnesses caused by smoking, including chest pain, cardiac disease, lung disease, and stomach disease. Young smokers' health is significantly impacted by their habit, with 20% experiencing headaches, 32.2% losing energy, 9.4% disrupting sleep, 30% experiencing chest pain, 32.8% feeling weak, 17.8% claiming it takes a long time to heal, and 5.3% experiencing minor health issues. Additionally, 52.9% of patients had multiple tongue ulcers, with single ulcer rates higher among frequent chewers and 47.1% of those who took gul in their mouths. Both

tobacco use and chewing betel nut pose significant risks for mouth cancer.

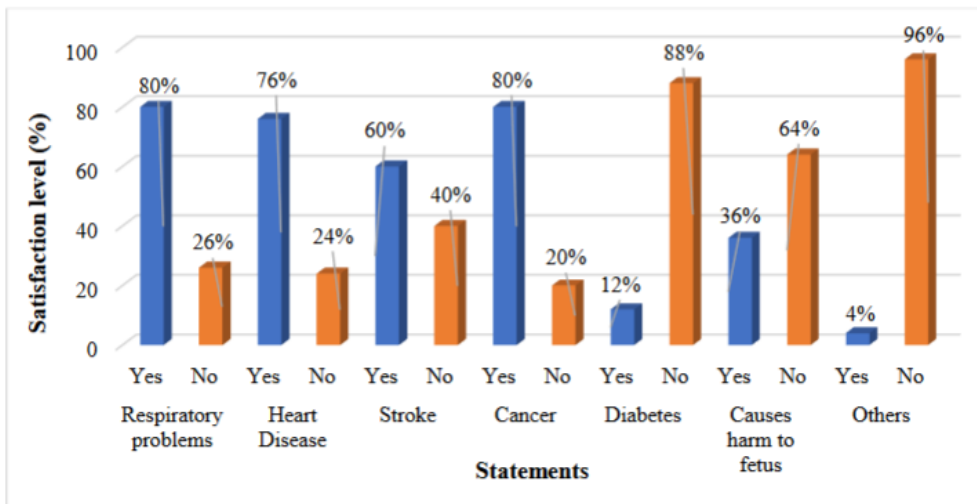
### 3.4 Knowledge and Perception of Health Hazards of Tobacco Use

**3.4.1 Knowledge of the health hazards due to smoking:** It is obvious from the above figure that almost all of the respondents (92%) had knowledge about the health hazards due to smoking and 8% had no knowledge about health hazards (Figure 7).



**Figure 7:** Tobacco users' knowledge about the health hazards due to smoking.

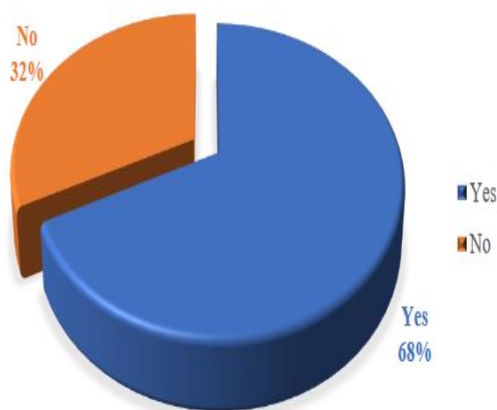
**3.4.2 Types of health hazards created by smoking:** Smoking poses various health risks, with 80% of respondents believing it causes cancer, respiratory problems, heart disease, strokes, and diabetes, while the least probable diseases are 12%, 36%, and 4% (Figure 8).



**Figure 8:** Tobacco users' knowledge about the health hazards due to smoking.

GATS found that 88.9%, 89.5%, and 94.8% of adults believed smoking caused heart attacks, lung cancer, and strokes. Smokers had higher knowledge scores for lung cancer, lung decay, and discolored teeth, while non-smokers had lower knowledge scores.

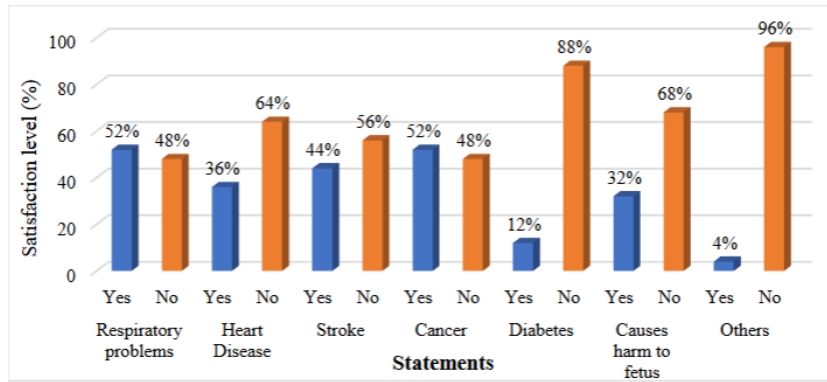
**3.4.3 Knowledge of the health hazards due to nonsmoker tobacco users:**



**Figure 8:** Tobacco users' multiple response about the types of health hazards created by nonsmoking tobacco.

The majority of respondents (68%) are aware of the health risks associated with smokeless tobacco products. 32% are unaware of the risks to their health (Figure 8).

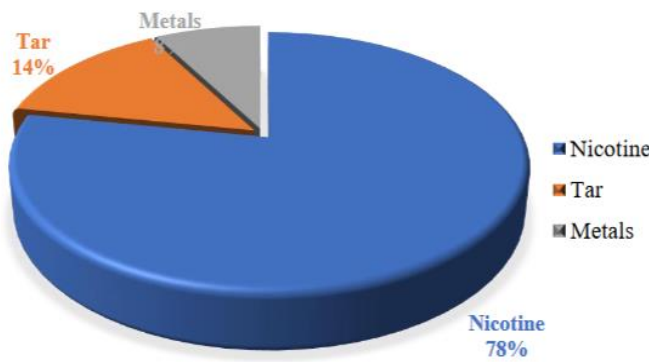
**3.4.4 Types of health hazards created by a nonsmoker:** Non-smoking tobacco poses various health hazards, with 52% of respondents believing it causes cancer, respiratory problems, strokes, heart disease, fetal harm, diabetes, and others (Figure 9).



**Figure 9:** Tobacco users' multiple response about the types of health hazards created by nonsmoker.

GATS [3] reported that, 82.0%, 82.5%, and 91.0% of adults believed using smokeless tobacco causes stroke, heart attack, and oral/mouth cancer, respectively.

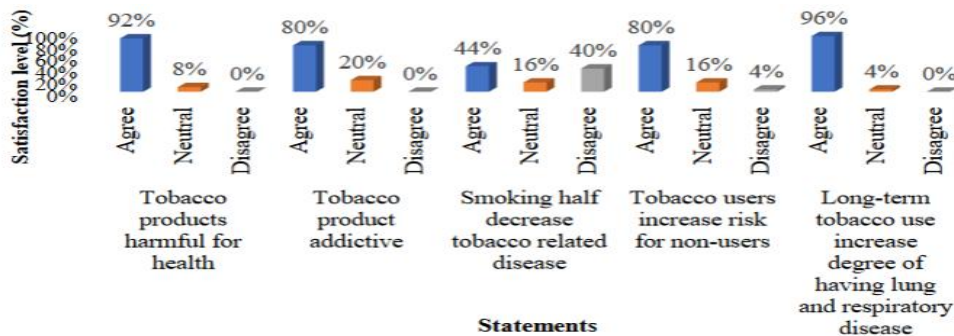
**3.4.5 Types of elements containing tobacco:** Different types of elements that contain in tobacco. These elements are harmful for our health. It should be mentioned that 78% of respondents said their tobacco contains nicotine, whereas 14% and 8% said their tobacco contains tar and metals respectively (Figure 10).



**Figure 10:** Tobacco users' response about types of elements containing tobacco.

Jradi et al. (2014) found that only 16% of medical students believe carbon monoxide, found in tobacco smoke, is responsible for increased coronary artery disease risk. At least 42% mention tar, nicotine, or a combination of both. Siahpush et al. (2006) found that 51.7% of respondents believe tobacco smoke contains cyanide, 17.1% mercury, 42.1% arsenic, and 85% carbon monoxide.

**3.4.6 Opinions on different health hazards related to tobacco use:** Figure 11 shows 92% of respondents agree that tobacco products are harmful and addictive, increasing the risk of lung and respiratory diseases. 44% agree, 40% disagree, and half believe smoking half decreases these issues.



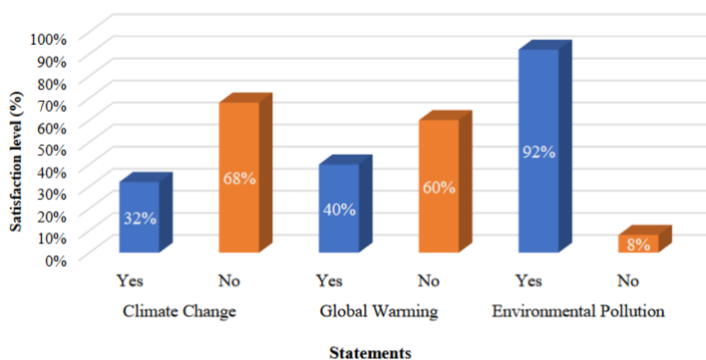
**Figure 11:** Opinions on different health hazards related to tobacco use.

The majority of current smokers believe tobacco is addictive and harmful to non-smokers (88.5%). However, less than a fifth of smokers believe it has harmed their health, and one-third of current smokers (33.7%) express no concern about future harm. Quitting smoking within six months would significantly improve their health. Out of 250 people studied, 88.4% were aware of tobacco's health risks.

### 3.5 Impact of Tobacco Toxicants on Environmental Pollution

#### 3.5.1 Smokers' perceptions of environmental pollution, global warming, and climate change:

Tobacco products cause environmental pollution, deforestation, climate change, and global warming. Growing and curing tobacco leaves lead to deforestation, while secondhand smoke, or environmental tobacco smoke, pollutes indoor and outdoor environments. Most tobacco users are unaware of these issues, but 92% are aware of environmental pollution Goon, S., & Bipasha, M. S. [5-12]. Prevalence and Pattern of Smoking among Bus Drivers of Dhaka, Bangladesh. Tobacco Use Insights, 21-25.

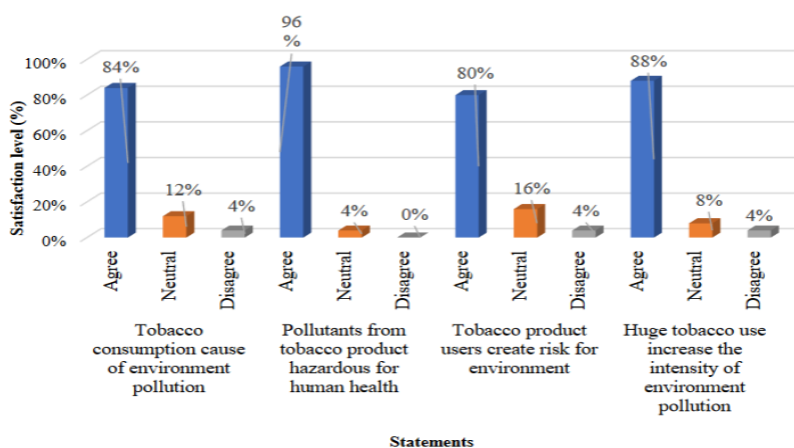


**Figure 12:** Tobacco users' idea about climate change, global warming and environmental pollution.

Tobacco smoke pollutes indoors, outdoors, and remains toxic after extinguishing, with 967 million daily smokers consuming 6.25 trillion cigarettes in 2012.

#### 3.5.2 Tobacco Users' Opinions on Different environment pollution:

Figure 13 shows 84% of respondents believe tobacco consumption causes environmental pollution, with 96% stating pollutants are hazardous for human health. Large tobacco use increases pollution intensity, with 80% stating users create environmental risks.



**Figure 13:** Tobacco users' opinion on different environment pollution.

79.4% of respondents believe smoking pollutes the environment and 65% think it degrades school atmosphere.

### Conclusion

Tobacco products significantly impact human health and environmental pollution in Bangladesh, with tobacco being the leading cause of preventable death worldwide. The majority of

people die from tobacco-related illnesses, and most users begin using tobacco in their middle years. To address this issue, the Government of Bangladesh should implement policies to stop smoking in public places, increase taxes on tobacco products, and conduct educational campaigns and workshops to raise awareness about the harmful effects of tobacco on health and the environment.



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## Author Contributions

All co-authors have been involved in all stages of this study while preparing the final version. They all agree with the results and conclusions.

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## Declaration of Interest

The authors declare that they have no competing interests.

## Ethics Approval and Consent to Participate

Not applicable.

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