



## Original Article

# A Statistical Overview of Death due to Alcohol Poisoning in the Rajshahi Region

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### Abstract

**Introduction:** The prevalence of death due to alcohol poisoning is increasing at an alarming rate in Bangladesh. However, there is a lack of actual statistics regarding death cases due to alcohol poisoning in the Rajshahi region. Therefore, this study was designed to explore the recent statistical report of death cases due to alcohol poisoning in the Rajshahi region.

**Methods:** The Department of Forensic Medicine & Toxicology, Rajshahi Medical College, Rajshahi, Bangladesh, conducted this statistical study, reporting 29 deaths between January 2019 and September 2021. The data was collected from the documents stored in the Department of Forensic Medicine & Toxicology.

**Results:** This study elucidates that the incidence of death due to alcohol poisoning is increasing over time. Ninety-three percent of victims were male. The maximum number of deaths (34.5%) due to alcohol poisoning was found in people between 21 and 30 years old. The maximum number of victims (27.59%) in the profession were students. Around two-thirds of the deceased were married. Only 24% of victims were other than Islam religion.

**Conclusion:** As the rate of death due to alcohol poisoning increases over time, it might indicate an increasing number of alcohol consumers. Besides, the lack of consciousness is associated with unwanted death.

**Keywords:** Alcohol, Poisoning, Unnatural death.

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### Introduction

Alcohol intake is the cause of more than 200 illnesses in human.<sup>1,2</sup> Annually, 3.3 million people die worldwide due to alcohol consumption.<sup>1, 2</sup> Throughout the world, alcohol consumption accounts for 5.9% of all deaths, much more than deaths caused by human immunodeficiency virus infection (2.8%) and tuberculosis (1.7%).<sup>1</sup> World Health Organization (WHO) defined alcohol consumption as one of the top four risk factors for non-communicable diseases.<sup>3</sup>

Alcohol is absorbed through the proximal gastrointestinal tract, and its metabolism starts in

the liver through the alcohol dehydrogenase enzyme. But, acute toxicity starts in the central nervous system by enmeshing central nervous system (CNS) inhibition and reducing excitation simultaneously.<sup>4</sup> Gamma-aminobutyric acid (GABA), the primary CNS inhibitory neurotransmitter, drags to its receptors allowing entry of Cl<sup>-</sup> ion into the cell, thus reducing cellular excitability.<sup>4</sup> Sedation, cognitive dysfunction, and decreased coordination arise from binding alcohol with GABA receptors and activating the inhibitory cascade.<sup>4</sup>

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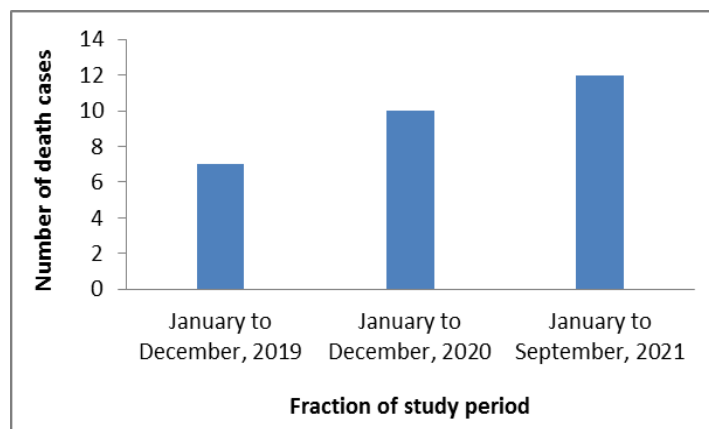
Multiple organ systems can be affected by alcohol. Both acute and chronic use of alcohol can induce complications. The cardiovascular system is one of the vulnerable systems to both acute and chronic injury. Acutely, alcohol is reported to precipitate dysrhythmias such as atrial fibrillation, supraventricular tachycardia, and ventricular tachycardia and can lead to lethal arrhythmias in patients with myocardial infarction.<sup>4</sup> Besides, contractile dysfunction leads to heart failure, stroke, and increased risk of cardiac death caused by acute alcohol poisoning.

Bangladesh is a country where diverse ethnicity, culture, and religion exist. Although it is generally accepted that alcohol consumption and related issues are low due to religious and social background, authorized barriers to restricting alcohol consumption by any particular group in this country do not exist.<sup>5-7</sup> The population of this country is made up of Bengali communities and ethnic tribal groups. Most of them are Muslims, and the rest are Hindus, Buddhists, and Christians.<sup>8</sup> According to statistics, the alcohol intake rate was assessed to be markedly low compared to the global average and western countries.<sup>3</sup> However, as far as we know, there is no systematic epidemiological assessment of alcohol

## Results

### Distribution of total death cases according to year

Among 29 deaths from alcohol poisoning from January 2019 to September 2021, 7 died in 2019 (Figure I). Later, the death cases increased to 10 in 2020 (Figure I). But, in 2021, there were 12 death cases in only 9 months (Figure I).



**Figure I:** Distribution of total death cases according to year.

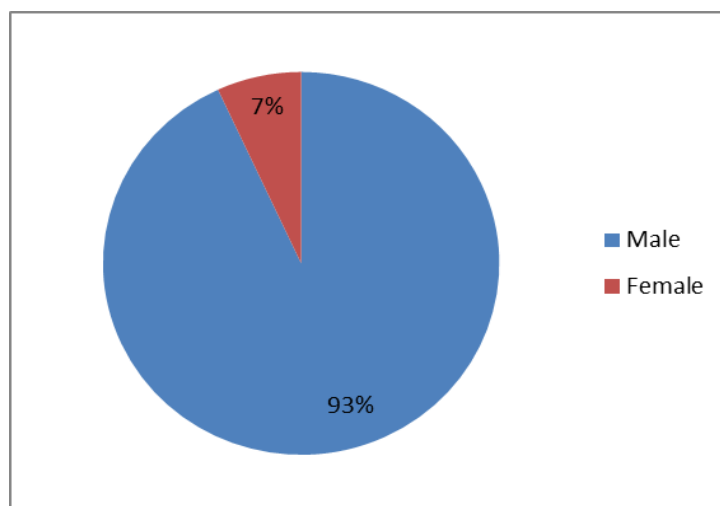
consumption and its adverse effects on Bangladesh's population. Nonetheless, there is no epidemiological study on alcohol consumption patterns in this country.<sup>9, 10</sup> Moreover, there is a lack of statistical reports on annual death due to alcohol poisoning in Bangladesh. Thus, this study was designed aiming to explore the statistics of death due to alcohol poisoning in the Rajshahi region.

## Materials and Methods

This descriptive study was conducted in the Department of Forensic Medicine & Toxicology, Rajshahi Medical College, Rajshahi, Bangladesh. The accumulated study subject includes only deaths due to acute alcohol poisoning from January 2019 to September 2021. A total of 29 study subject was included in this study. All of the information presented in the article were accumulated from the corresponding document of the dead body, which was submitted to the Department of Forensic Medicine & Toxicology for autopsy. Statistical analyses (percentage calculation) and the graph was done using Microsoft Excel (version 2007).

### Distribution of total death cases according to sex

Among 29 victims, 27 (93%) were male, and only 2 (7%) were female (Figure II).



**Figure II:** Distribution of total death cases according to sex.

### Distribution of total death cases according to age class

According to the age class presented in Table 1, the maximum number of victims, 10 (34.5%), was between 21 and 30 years old. The lowest number of the victim was observed in people who are aged more than 50 years old. However, the second highest number of victims (8, 27.6%) was between 31 and 40 years. Five (17.2%) victims were between 41 and 50. There were 4 (13.8%) young (between 11 and 20) victims.

**Table 1: Distribution of total death cases according to age.**

Age (years)	Frequency	Percentage
11-20	4	13.8
21-30	10	34.5
31-40	8	27.6
41-50	5	17.2
51-60	1	3.4
61-70	1	3.4

### Distribution of total death cases according to professional status

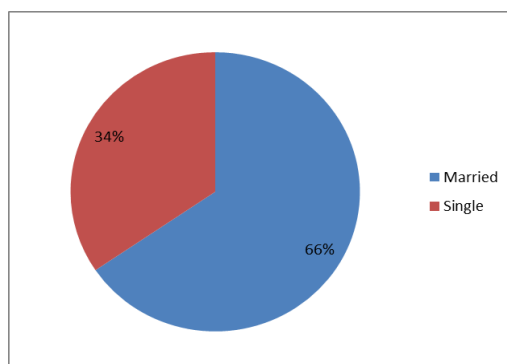
As we found, the maximum number (8, 27.59%) of victims were a student. Among eight students, one was a female. Businessmen and farmers contributed 13.79% individually. 10.34% of victims had a job in a reputed organization. One housewife and a male victim without any profession contributed 3.45% each. The rest of the 27.59% comprised different types of professions, including butcher, confectioner, goldsmith, painter, sweeper, salesman, and village doctor.

**Table 2: Distribution of total death cases according to the profession.**

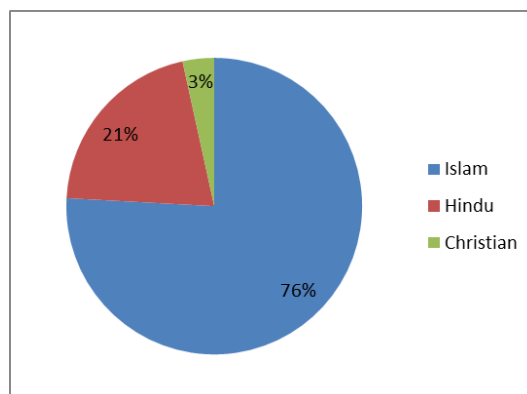
Categories	Frequency	Percentage
Student	8	27.59
Businessman	4	13.79
Farmer	4	13.79
Job	3	10.34
Housewife	1	3.45
Unemployed	1	3.45
Others (butcher, confectioner, goldsmith, painter, sweeper, salesman, village doctor)	8	27.59

**Distribution of total death cases according to marital status**

Most of the victims (19, 66%) were married, whereas 10 (34%) victims were single (Figure III).

**Figure III:** Distribution of total death cases according to marital status.**Distribution of total death cases according to religion**

The maximum number of victims (76%) was Muslim (Figure IV). The percentage of victims from Hindu and Christian was 21% and 3%, respectively (Figure IV).

**Figure IV:** Distribution of total death cases according to religion.



## Discussion

In Bangladesh, the prevalence of alcohol consumers in general has been estimated at less than 2%.<sup>11</sup> This estimation agrees with the data regarding alcohol consumption percentage in developing countries, particularly in the South East Asia region, reported by WHO.<sup>12</sup>

The alcohol consumption rate in Bangladesh has been increasing over time.<sup>11</sup> Our data regarding increased death due to alcohol poisoning presented in Figure 1 may reflect that the alcohol consumption rate is increasing. However, estimating the actual amount of alcohol usage is difficult because of many factors including increased domestic production, the increased sum of permits issued for drinking, and greater amount of confiscations of illegal liquor.<sup>11</sup>

The rate of alcohol consumption in Bangladesh is higher in young aged individuals.<sup>11, 13</sup> According to our data, most of the victims were between 20 and 40 years old. In the USA, the maximum death due to alcohol poisoning was observed between 35 and 64 years old.<sup>14</sup>

The prevalence of alcohol consumption is higher in university students, sex workers, substance abusers, truck drivers, indigenous people, homeless children, and individuals living in families with a history of alcohol drinking.<sup>11</sup> Here, we found the maximum number of victims (27.59%) were a student. Students are more prone to consume alcohol for the purpose of recreation.<sup>15</sup> Sometimes, they may not have consciousness of a safe amount of consumption. This might be the cause of poisoning leading to death. Though the maximum number of victims were a student who seemed to be unmarried, two-thirds of the victims were married. Marital status is strongly linked with drinking alcohol. Usually, people who are divorced are likely to drink more alcohol leading to more poisoning rate.<sup>16, 17</sup> Unlike the previous report, we found that most deceased was married, which might indicate a high alcohol consumption rate in married people. This unwanted situation might be a result of misunderstanding in conjugal life.

Moreover, 76% of victims were Muslim, Hindus were 21%, and Christians were 3%. This is probably because Bangladesh is a Muslim-majority country.

In Bangladesh, due to restrictions in accessibility to and inability to afford ethyl alcohol, people consume methanol-contaminated alcoholic drinks or industrial methylated spirits (95% ethanol + 5% methanol).<sup>11, 18</sup> However, these compositions are highly detrimental, causing severe poisoning and leading to death.

## Conclusion

The data presented in our report shows an increasing death rate due to alcohol poisoning. Thus, training people working in healthcare centers and making awareness in general people is crucial to prevent death from alcohol poisoning. Besides, controlling measure is also needed in term of the easy availability of industrial alcohol.

**Conflict of interest:** None declared

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