

## The Pattern and Trends of Burn Related Death

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### Abstract

**Background:** Since ancient times fire has kept amusing mankind in various ways. Though it has helped human to evolve but if mishandled can lead to serious consequences. We know that fire can be a friendly, comforting thing, a sources of light and heat, yet fire can also be most dangerous and deadly. Burn is the one of the commonest cause of unnatural death in the world.

**Objectives:** To find out the causes, epidemiological factors and pattern and trends of burn related death.

**Methods:** The present study was conducted at Dhaka Medical College and Hospital, for a period of 1 year from January 2022 to December 2022. A total number of 1792 autopsy was done among of which 418 cases were burn. Convenience sampling technique was followed and sample size was 418 cases of burn among 1792 cases .Data were collected from police inquest, department Register Khata from the department of Forensic Medicine and Toxicology at Dhaka Medical college..Data were analyzed, tabulated and presented by using SPSS version 16.0.

**Results:** During the study maximum death due to burns were found in labourers 233(55.74%). Maximum death due to burn were found in illiterate 158(37.79%). Maximum cause of death due to burns were found in low socioeconomic status 213(50.95%) and the maximum death due to burn were found in the age group 21-40 years 234 (55.98%). Maximum cases of death due burns were found in male which contributed to 293(70.09%) of the total death. The most common source of fire in death due to burn was cylinder gas explosion 208(49.76%). Maximum cases of death due to burn occurred in workplace 184(44.01%). As a result of burn, shock was the predominant cause of death 287(68.66%). Accidental 316(75.59%) burn was the most common manner of death due to burn.

**Conclusion:** The most accidental burn cases were preventable. By giving proper education and awareness about the causes of burn, burn injury and post burn complications. So we should take proper preventive methods that may reduce mortality and morbidity rate due to burn.

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## Introduction

Burn is an injury which is caused by application of heat by conduction, radiation or chemical substances to the external or internal surface of the body which causes destruction of tissue.<sup>1</sup> Burns are the fourth most common type of trauma world wide, following traffic accident falls. and interpersonal violence.<sup>2</sup> The most common cause of flame burns in modern society is accidental.<sup>3,4</sup> Always burn have posed a threat to the sensitive human body. One of the most challenging condition encountered in Medicine due to burn. Due to burn injury it represents an assault on all aspects of the patient. The result of burn injury it effects both physically and psychologically. It affects all ages, sexes, from children to elderly people and it also a great problem in developed and developing countries. Burn injuries is produced by application of dry heat, such as radiant heat, flame or any other heated solid substance like metal or glass to the surface of the body.<sup>5</sup> From heat local injuries occurs when an external source of heat rises of temperature of the tissue approximately above 44.0 degree centre grade ,these temperature is enough to damage the tissue in the body. Old person and children are the most vulnerable person to such injury. A morbid infection after burns, where a large portion of the skin is damaged, is a very serious complication that often results in the death of the patients.<sup>6</sup>

### Objective

This study was done to find out the causes, socioepidemiological factors, pattern and trend of burn related death.

### Method

The present study was conducted at Dhaka Medical College and Hospital, for a period of 1 year January 2022 to December 2022. A total of 1792 medico legal autopsy cases were carried out during this period out of which 418 were death due to burn, all the cases were

referred from a total of 23 police station .Convenience sampling technique was followed and sample size was 418 cases of burn among 1792 cases .Data were collected from police inquest, department register. Data were analyzed, tabulated and presented by using SPSS version 16.0.

### Result

Data of 418 cases of burn collected from the full autopsy report from the department of Forensic Medicine and Toxicology at Dhaka Medical College during the years of January 2022 to December 2022. An analysis has been made based on the sociodemographic profile with the following results,

Table I: Occupation wise distribution of burns (n=418)

Occupation	Frequency	Percentage
Labourer	233	55.74%
Business man	48	11.48%
House wife	65	15.55%
student	12	2.87%
child	08	1.9%
Padestrian	29	6.93%
Farmer	23	5.50%

Maximum death due to burn in labourers 233(55.74%) followed by house wife 65(15.55%) and business 48(11.48%).

Table II: Educational status wise distribution of burns (n=418)

Education of the victim	Frequency	Percentage
Illiterate	158	37.79%
Junior school	36	8.61%
Middle school	78	18.66%
High school	58	13.87%
Graduate	67	16.02%
Post graduate	21	5.02%

Maximum death due to burns were seen in illiterates 158(37.79%) followed by middle school 78(18.66%) and graduate 67(16.02%).

Table III: Distribution of deaths due to burns based on socioeconomic status (n=418)

Socioeconomic status	Frequency	Percentage
Low socioeconomic status	213	50.95%
Middle socioeconomic status	166	39.71%
High socioeconomic status	39	9.33%

Maximum causes of death due to burns were seen in low socioeconomic status 213(50.95%) followed by middle socioeconomic status 166(39.71%).

Table IV: Age wise distribution of death due to burns (n=418)

Age in year	Frequency	Percentage
Birth to 10	06	1.43%
11-20	49	11.72%
21-40	234	55.98%
41-60	109	26.07%
61-80	16	3.82%
Above 80	04	0.95%

Maximum death due to burn were seen in the age group of 21-40 years which constituted 233(55.74%) of death followed by 41-60 (109(26.07%) years and 11-20 years 49(11.72%).

Table V: Sex wise distribution of death due to burn (n=418)

Sex	Frequency	Percentage
Male	293	70.09%
Female	125	29.90%

Maximum cases of death due to burns were seen in Male which contributed to 293(70.09%) of the total death.

Table VI: Distribution of death due to burns based on source of fire (n=418)

Source of fire	Frequency	Percentage
Cylinder gas explosion	208	49.76%
Pump stove explosion	62	14.83%
Petrol or diesel explosion	92	22.00%
kerosene	23	5.50%
Wood fire	13	3.11%
Match stick	20	4.78%

The commonest source of fire in death due to burn was cylinder gas explosion 208 (49.76%) followed by inflammable material like petrol or diesel explosion 92(22.00%) and pump stove explosion 62(14.83%).

Table VII: Distribution of death due to burns based on site of incidence (n=418)

Site of incidence	Frequency	Percentage
Work place	184	44.01%
Kitchen	33	7.89%
Out door	135	32.29%
Living room	46	11.00%
Court yard	20	4.78%

Maximum cases of death due to burns occurred in work place 184(44.01%) followed by outdoor 135(32.29%) and in the living room 46(11.00%).

Table VIII: Causes of death (n=418)

Cause of death	Frequency	Percentage
Shock due to burn	287	68.66%
Septicaemic shock	88	21.05%
Toxaemia	43	10.28%

Shock due to burns was the predominant cause of death 287(68.66%) followed by septicaemic shock 88(21.05%).

Table IX: Manner of death (n=418)

Manner of death	Frequency	Percentage
Accidental	316	75.59%
Suicidal	83	19.85%
Homicidal	19	4.54%

The most common manner of death due to burns was found to be accidental 316(75.59%) followed by suicidal 83(19.85%) and homicidal cases contributed to 19(4.54%) of the total death.

### Discussion

In all societies developed or in the developing countries, burn issue not only Medical and psychological problems, but they also produce severe economic and social consequences on the victims families and also on the society in general. The present study, there is a predominance of maximum death due to burns were seen in labours 233 (55.75%). Labours are work in both indoor, outdoor and industrial area. Thermal, chemical, electrical, and gas explosion burn injuries are common in workplace. More than 350,00 workers die each year due to unintended occupational injuries world wide. Maximum death due to burn were seen in illiterate 158(37.79%). Illiterate people does not know how to safely use workplace equipment especially heat regulatory machine or electrical equipment. That's why they are more vulnerable person to risk of burn injury. On the other hand also sufferer to burn injury due to their illiteracy. Women are not well known how to safely use their cooking gas stove or gas cylinder. They also use kerosene for lighting purpose at night because electricity is not available in rural area. We have to know that kerosene oil is one of the fire inducing agent. So, some if carelessly use kerosene it may occurs burn injury also.

Maximum cases of death due to burns were seen in the low socio economic status 213(50.95%). These incidence occurs may be due to their financial crisis, poverties, stress related to work and lack of basic safety education has been associated with increased risk for burn injuries <sup>7</sup>. However previous study indicate that population with lower socio economic status who live in rural

community are more to vulnerable to burn injuries. It is not surprising that burn injuries are also more common in populations with lower socioeconomic status and delayed developmental grow.<sup>8,9,10</sup>

Maximum death due to burn were seen in the age group of 21-40 years which constitute 234(55.98%). The person of these young age group are suffering from stress of the modern life style, family problems, financial problems.

Maximum cases of death due to burns were seen in males 293(70.09%). In literature It was reported that males constitute majority of fire related cases.<sup>11,12</sup> Males are more vulnerable person because they work in both indoor and outdoor risky job. They work as labour, electrician, driver, sometimes cooking purpose as a safe in hotel etc. These are the risky zone for burn injury.

Maximum cases of death due to burns occurred in cylinder gas explosion 208(49.76%). A study from Cambridge reported of 57% of the burns to occur at work place, which where employment related among the different sources of the fire like cylinder gas explosion. In the gas explosion accidents the indoor explosion accident particularly.<sup>13</sup> Accidental cases, the inflammable substance was accidentally spread or used for some other purpose in surrounding explosion accidents are valuable harming cases for people to recognize large scale space gas explosion in essences and analysis and the investigation of explosion accidents have become an important means for the people to realize and understand the risk characteristic of gas explosion accidents. After analyze the cause of cylinder blast people can also improve the quality and technical system of gas cylinder and prevent gas explosion.

Maximum cause of death due to burn occurred in workplace 284(44.01%) followed by the outdoor and living room. Electrical, thermal, chemical and explosion burns are common in work place. Burn in workplace area substantial social and economic threat to individual and families; as also the community of a country. In the work place burn injury incidence occurs mostly due to lack of awareness by workers, lack of attention to the use of safety equipment at work. Although it was reported in the literature that the events occurred in closed area.<sup>14</sup> Despite numerous safety measures and guidelines, burns in the “work place continue to account for a considerable proportion of all burns.<sup>15</sup> There are studies showing substantially high number of burn injuries occurring in the workplace ranging from 10 to 45% of all burns.<sup>16</sup> The lack of awareness by workers lack of attention to the use of safety equipment at work and the presence damage equipment's at work are the main causes of burn accident in work place.

Shock due to burns was the predominant cause of death 287(68.66%) followed by septicemic shock 88(21.05%). This is in contrast to the study conducted by Dr.GirishV. Tasgaonkar, Dr.K.U.Zine, Dr.Vikas. P et al.<sup>17</sup>

Instantaneous death in case of burn is due to neurogenic shock. In the study the most common manner of death due to burns was found accidental-Buchade D et al, also found that most common manner of the burn was accidental 147(62.02%) cases, followed by suicidal in 62 (26.16%) and homicidal in 28(11.82) cases. Mangal HM most of the burn victims the manner of death was accidental in 183 cases (61%), followed by suicidal in 105 cases (35%) and homicidal in only 12(4%) cases. Similar observations were seen by Das KC<sup>18</sup> and Bengal RS.<sup>19</sup>

### Conclusion

The epidemiological factors of the burn is very in different countries. The Government along with various working groups. The doctors and the NGO's need to put in more sincere effort. We have to promote safer cook stoves and less hazardous fuel. And apply safely regulations to housing design and materials and encourage home inspection. Promote the safety education and the use of smoke detectors, fire sprinklers and fire escape systems in home. Promote introduction of and compliance with industrial safety regulations. These steps should not taken only minimize burn mortality but also to prevent and reduce their incidence at least in cases where human errors human greed plays. the present study is concluded with the hope that if we followed all above the steps and suggestions will help in reducing the number of burn injuries.

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