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BURN PREVENTION AND FIRST AID KNOWLEDGE AMONG HIGH SCHOOL STUDENTS IN BANGLADESH

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Abstract: *Burn injuries are one of the serious global public health problems. The high rate of burn death and disability in developing countries is all the more tragic because it is so preventable. Children are the most vulnerable group for burn injury as they have less perception about dangerous situations and a limited ability to react promptly and properly. The aim of this study was to determine high school student's burn prevention and first-aid treatment knowledge. The study was conducted at Allardargah High School at Doulatpur Upzila of, Kushtia district under Khulna division of Bangladesh. A total of 150 purposively sample respondents were interviewed through semi-structured questionnaires for collecting information. The descriptive analysis including some statistical test was done for this study. The study revealed that majority of the respondents had the previous knowledge of burn prevention and first aid, which they gained from their school. Moreover, a statistical significant associations ($p<0.05$) between previously received information and current knowledge on burn first aid was found. This study also revealed that majority of respondents has exposure to television and getitng knowledge on the issue and was intended to learning more on burn prevention and first aid from their school. Burn prevention program should be designed and implemented to determine the ability of a public education program to increase awareness about burn hazards and reduce the incidence and severity of burn injuries. Media messages should be transmitted to the school students and community interventions should be implemented in communities.*

Keywords: *Participants, burns, first aid, knowledge, prevention, injury.*

Introduction

Globally, burn injuries are one of the most devastating and major public health problems. There are over 300,000 deaths per year from fires alone, with more deaths from other types of burn, including scalds, and electrical and chemical burns. In addition, millions more are left with lifelong disabilities and disfigurements, often with resulting stigma and rejection[1]. All of these result in further personal difficulties and economic losses for victims and their families. The vast majority (over 95%) of these burns occur in low- and middle income countries. Rates of fire-related burn deaths in low- and middle income countries are 5.5 deaths/100 000 people per year[1], which is nearly six times higher than the 0.9 deaths/100 000 people per year in high-income countries.

According to the WHO Global Burden of Disease estimate for 2004, fire related burns kills 310,000 people and 30% of them were under the age 20 years. Fire related burns are the 11th leading cause of death for children aged 1-9 years[2]. Although burn is a global health problem, people of LMICs suffer more[3]. An estimated 128,000 persons died of burn injuries in countries of the South East Asia Region in 2000. It's also estimated that half of the global burden of fire related burn was from South-East Asia[4].

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The high rate of burn death and disability in developing countries is more tragic as burns are so preventable. Burn prevention efforts in high-income countries have successfully and sustainably lowered burn rates over the past 30 to 40 years[1]. To confront the unacceptable burden of burns in low- and middle income countries, WHO, the International Society for Burn Injuries (ISBI), and other partners met in 2007 to establish A WHO plan for burn prevention and care[5]. This meeting established an agenda for action for stakeholders worldwide.

In terms of morbidity and long term disability, burn poses a major public health issue throughout the world, especially in low income countries[6]. Considering physical, psychological, social and economic consequences, burns have been identified as one of the most devastating causes of child injury[7]. Children are the most vulnerable group for burn injury as they have less perception about dangerous situations and a limited ability to react promptly and properly[8]. In Africa and many of the South-Asian countries (e.g. India, Pakistan, Nepal, Sri Lanka and Afghanistan), childhood burn injury has emerged as a major public health problem[9]. In low income countries (LICs) burn care is a complicated health care issue as it requires specialized staffing and technologies that are expensive and not always readily available[10]. The long recovery period and complicated morbidity associated with burns adds to the high cost of rehabilitation[11] and creates economic burden to the families.

Very few studies have been conducted on burn injuries in Bangladesh. The majority of studies conducted on burn injury were on acid burn and most of them were acts of violence. Females were the major victims of acid burn and the majority was due to refusal of love proposals[12]. A multi-country study revealed that the highest incidence of chemical assault had occurred in Bangladesh[13]. A hospital-based study revealed that burn was a major cause of injury death among women aged 10-50 years in Bangladesh[14]. Another child hospital-based study showed that more than 9% of admissions in surgical wards were due to burn and represents the second most common cause of surgical problem in Bangladesh[15]. The aim of this study was to determine high school student's burn prevention and first-aid treatment knowledge.

Materials and methods

The study utilized descriptive cross- sectional study to determine the high school student's burn prevention and first-aid treatment knowledge. This study was carried out at Allardargah High School, Doulatpur Kushtia. Doulatpur is located Kushtia district under Khulna Division. As of the 2011 Bangladesh census[16], Doulatpur has a population of 456,372.

The total sample size for the study was 150 students who were available and willing to participate in this study. A pretested semi-structured questionnaire was used for this study and it was divided into three sections; socio-demographic section, knowledge of burn prevention practices and knowledge on first aid treatment and practices. The questionnaire included a range of close ended questions as well as some open questions. All the data collected were coded numerically and entered into the SPSS version 22.0 software program for analysis. Descriptive statistical analysis was used to calculate the frequencies and percentages. The descriptive analysis of data was presented as tables and graph format. For some analysis using Pearson Chi-square test was also done, a p-value ≤ 0.05 was considered significant. Informed written consent was taken from the participants, as well as from the school authority and confidentiality of participant's information was maintained properly where participant had the choice to refuse and withdraw from the interview. The study obtained permission for data collection from the Department of Public Health under the faculty of Allied Health Sciences, Daffodil International University (DIU).

The limitation of the study was that the 150 samples, which was purposively selected because of the study required for the partial fulfillment of Master of Public Health course at DIU. Moreover, the study conducted in the specific area of Bangladesh which may not reflect entire picture of Bangladesh. Therefore, we should be very careful to generalize the data for the country.

Results

Background characteristics

Regarding the distribution of respondents based on socio-demographic factors (Table 1), about half (46.7%) of the respondents were in the age of below 15 years, and the remaining were in the age 15 years and above. The mean age of the respondents was 14.5 years with the rage of 12 to 18 years. Regarding the gender of the respondents highest majority of the respondents were males (94.7%). Education is very important socio-demographic factor, in this study according to mothers education level, 28.7% of them had no formal education while 9.3% mother had degree and above level of education. On the other hand regarding father's education level, 26.7% had no formal education while 14.0% fathers had degree and above level of education. According to mother's occupation 99.3% were housewives (not shown in the table), and a higher proportion of fathers were doing Business (36%), which followed by agriculture (31.8%) and service (18.0%). Majority (71.3%) of the students were from single family, the remaining were from joint family.

Table 1: Distribution of Respondent's Socio-demographic Characteristics (n= 150)

Characteristics	Number	Percentage
Respondent's Age		
< 15 years	70	46.7
15 years & above	80	53.3
Respondent's Studentship		
Class VII & VIII	85	56.7
Class IX & X	65	43.3
Gender		
Female	8	5.3
Male	142	94.7
Mother Education		
No formal Education	43	28.7
School Education	39	26.0
SSC & HSC	54	36.0
Degree & Above	14	9.3
Father Education		
No formal Education	40	26.7
School Education	25	16.7
SSC & HSC	64	42.7
Degree & Above	21	14.0
Father Occupation		
Agriculture	47	31.3
Service	27	18.0
Business	54	36.0
Others	22	14.7
Family Type		
Nuclear	107	71.3
Joint	43	28.7

Respondent's previous knowledge on burn Prevention & first aid according to school grading shown in Table 2. The higher grade students were more knowledgeable (84.7%) on the subject matter than the junior grade student, which constitute 69.2% of respondents. A statistical difference ($P<0.05$) was found between higher grade and junior grade of schooling for previously perceived knowledge on burn prevention and first aid.

Table 2: Previous Knowledge on Burn Prevention & First Aid by School Grade (n= 150)

Previous Knowledge on Burn Prevention and First Aid	School Grading (Class)		p value
	VII-VIII	IX-X	
Yes	69.2%	84.7%	0.02
No	30.8%	15.3%	

In the respondent's distribution on sources of information, 96.6% of the respondents have received information related to burn prevention and first aid from their school while 4.1% got same information from family member and only few of them (1.4%) of the respondents have heard the information through television (Table 3).

Table 3: Source of Knowledge on Burn Prevention & First Aid

Sources (Multiple Responses)	Responses		Percent of Cases
	N	Percent	
From School	143	94.7	96.6
Family members	6	4.0	4.1
Television	2	1.3	1.4
Total	**151**	**100.0**	**102.0**

In the respondent's distribution on media exposure, 89.3% of the students have exposure to Television and 14.7% of them have Radio exposure. Regarding the internet access, about one-thirds of the respondent have regular internet access, 54.3% have accessing sometimes and only few (5.3%) have rarely access to the internet (Table 4).

Table 4: Respondent's Media Exposure

Electronic and Social Media	Number	Percent
Television (n=150)	134	89.3
Radio (n=150)	22	14.7
Internet (n=150)		
Regular Access	48	32.0
Sometime Access	68	45.3
Rarely Access	8	5.3
No Access	26	17.3

Perceived Opinion on Burn Prevention Practice and First Aid

Regarding the distribution of respondents based on opinion towards burn prevention, 98.7% of the respondents given true answer as 'it is not safe to refill a kerosene-stove or premium motor spirit generator while it's in use', 64.3% agreed that 'storing petrol at home can lead to fires', 82.7% of the

respondents believed that 'burn injuries are more frequent during the summer season', 25.3% of the respondents said false on the statement ' bush burning is harmful farming practice' while 72.0% of the respondents agreed that 'majority of burns sustained at home occur in the kitchen' (Table 5).
Regarding the distribution of respondents based on knowledge on different statements of burn first aid, a highest majority (94.0%) of the respondents agreed with the statement that 'all burn injuries must be treated in the hospital', which followed by 'stop, drop and roll when your clothes catch fire'(80.7%). About three-quarters (75.3%) of the respondents believed to 'apply cold water if hot oil spills on the hand' while 88.0% of the respondents did not believe that 'never apply raw eggs or herbs to burn wounds', and 72.7% 'do not remove clothing sticking to the body following a burn injury' (Table 5).

Table 5: Responses to knowledge of burn prevention practices and first aid (n=150)

Question	Responses	
	True (N, %)	False (N, %)
Knowledge on Burn Prevention		
It is not safe to refill a kerosene stove or motor oil tank or generator while it's in use	143 (95.3)	7 (4.7)
Storing kerosene/petrol at home can lead to fires	98 (65.3)	52 (34.7)
Burn injuries are more frequent during the summer season	124 (82.7)	26 (17.3)
Bush burning is a harmful farming practice	112 (74.7)	38 (25.3)
Majority of burns sustained at home occur in the kitchen	108 (72.0)	42 (28.0)
First Aid Knowledge		
Stop, drop and roll when your clothes catch fire	121 (80.7)	29 (19.3)
Apply cold water if hot oil spills on the hand	113 (75.3)	37 (24.7)
All burn injuries must be treated in the hospital	141 (94.0)	9 (6.0)
Never apply raw eggs or herbs to burn wounds	18 (12.0)	132 (88.0)
Do not remove clothing sticking to the body following a burn injury	41 (27.3)	109 (72.7)

In the association between previous knowledge on burn prevention and current receiving any information related to knowledge on prevention shown in the table below (Table 6), it has been seen that there was strong association between current knowledge and ever received information related to knowledge on burn prevention on 'storing petrol at home can lead to fire' ($p<0.01$) and on 'burn injuries are more frequent during the summer season ($p<0.05$). But it was found that there was no association between current and previous knowledge and ever received information related to burn prevention on 'It is not safe to refill a kerosene stove or motor oil tank or generator while it's in use', 'bush burning is a harmful farming practice' and 'majority of burns sustained at home occur in the kitchen' and on'.

The associations between previously received information and current knowledge on burn first aid, it was found that there was association ($p<0.05$) between knowledge on 'stop, drop and roll when your clothes catch fire'. There was also association exist between current knowledge on 'Never apply raw eggs or herbs to burn wounds' and previously received information ($p<0.05$). But association between current and previous knowledge was not found for 'apply cold water if hot oil spills on the hand', 'all burn injuries must be treated in the hospital' and 'Do not remove clothing sticking to the body following a burn injury' shown in send panel of the Table 6.

Table 6: Previous knowledge on burn prevention and first aid versus currently choosing correct answer on burn prevention and first aid

Current Chosen correct Answer	Previous Knowledge		P value
	Yes (N, %)	No (N, %)	
Knowledge on Burn Prevention			
It is not safe to refill a kerosene stove or motor oil tank or generator while it's in use	112 (78.3)	31 (21.7)	0.480
Storing kerosene/petrol at home can lead to fires	84 (85.7)	14 (14.3)	0.002
Burn injuries are more frequent during the summer season	93 (75.0)	31 (25.0)	0.039
Bush burning is a harmful farming practice	88 (78.6)	24 (21.4)	0.446
Majority of burns sustained at home occur in the kitchen	85 (78.7)	23 (21.3)	0.447
First Aid Knowledge			
Stop, drop and roll when your clothes catch fire	100 (82.6)	21 (17.4)	0.007
Apply cold water if hot oil spills on the hand	86 (76.1)	27 (23.9)	0.230
All burn injuries must be treated in the hospital	112 (79.4)	29 (20.6)	0.108
Never apply raw eggs or herbs to burn wounds	17 (94.4)	1 (5.6)	0.038
Do not remove clothing sticking to the body following a burn injury	34 (82.9)	7 (17.1)	0.254

According the distribution of participants based on class studying and currently choosing correct answer on knowledge of burn prevention, there were no significant differences found between the two groups of respondents. However, the students who are studying in higher grade (IX & X) had comparatively better knowledge then that of their counterparts who are studying in junior grade, i.e. class VI & VII (Table 7). Again, the associations between current knowledge on burn first aid and student's class levels; it was found that there was no association found for all statement chosen for current knowledge of first aid except the statement of 'all burn injuries must be treated in the hospital', which is significantly difference between the two class groups of students (Table 7).

Table 7: Class studying versus currently choosing correct answer on knowledge burn prevention and first aid

Current Chosen Correct Answer	Class Studying		P value
	VI-VII (n, %)	IX-X (n, %)	
Knowledge on Burn Prevention			
It is not safe to refill a kerosene stove or motor oil tank or generator while it's in use	61 (42.7)	82 (57.3)	0.354
Storing kerosene/petrol at home can lead to fires	41 (41.8)	57 (58.2)	0.368
Burn injuries are more frequent during the summer season	56 (45.2)	68 (54.8)	0.222
Bush burning is a harmful farming practice	46 (41.1)	66 (58.9)	0.220
Majority of burns sustained at home occur in the kitchen	66 (40.7)	64 (59.3)	0.199
First Aid Knowledge			
Stop, drop and roll when your clothes catch fire	51 (42.1)	70 (57.9)	0.347
Apply cold water if hot oil spills on the hand	51 (45.1)	62 (54.9)	0.280
All burn injuries must be treated in the hospital	58 (41.1)	83 (58.9)	0.038
Never apply raw eggs or herbs to burn wounds	5 (27.8)	13 (72.2)	0.121
Do not remove clothing sticking to the body following a burn injury	16 (39.0)	25 (61.0)	0.321

Attitude on Burn Prevention

Distribution of respondnet's attitude of future learning of burn prevention and first aid shown in Table 8. A higest majority of respondents (96.7%) was intended to learning more on burn prevention and first aid. The respondents who interded to future learning of this matter were chosen the learning sources at their respective schools while some were intending to learn outside their school.

Table 8: Attitude of future learning of burn prevention and first aid

Future intention to learn	Number	Percent
Intending to more future learning		
Yes	145	96.7
No	5	3.3
Total	**150**	**100.0**
Where intending to learn in future		
At School	137	91.3
Outside of School	8	5.3
Total	**145**	**100.0**

Discussion

In this study 150 students of Allardargah High School, Doulatpur Kushtia district of Bangladesh were participated and gave their responses regarding the knowledge on burn prevention and burn first aid. It was found that the mean age of the respondents was 14.5 years with more than half of them were in the age of 15 years and above , which indicated that majority of the participants were of younger age. In Bangladesh more than majority of the population lives in rural areas and it is likely to have the higher incidence burn, which is more than urban areas. So, educational status, socioeconomic condition and home environment could be the factors related to a high incidence of childhood burn. Parent's education level might play a huge role in the burn prevention and this study documented that majority of the parents had at least some formal education; even some of the parent were found highly educated. According to the parent occupation, mothers in compared to fathers, were more engage with household activities, which may have the better opportunity for children of leaning burn prevention and first from mothers as of close and longer association in the houses. The studies documented that family patterns like large families are associated with higher burn risk[17]. The result of this study revealed that majorities (71.3%) of the students were from single family, i.e. from the family with a smaller member size and few of them were from joint family.

The study results indicated that majority of the respondents had the previous knowledge of burn prevention and first aid. However, this knowledge was varied according to their grade of schooling and more knowledgeable proportion was prevailing among higher grade students. Though the different was statistically significant between the higher and lower grade of students, this is fallen in expectation of people as knowledge increases with the increasing of age of students. The result of this study again documented that a highest proportion of students were getting burn prevention and first aid knowledge from their school. This emphasizing the school based knowledge is the best sources for children in preventing accidental burn and adoption of immediate first aid. Several studies have shown the effectiveness of using the mass media for health-related prevention programs[18, 19]. In the respondent's distribution on media exposure, majority of respondents in this study had the exposure to Television and to some extended internet access. This wide range of media exposure could be the helpful way in preventing burn accident that will affect people's health. A similar study of burn prevention knowledge and first aid treatment amongst school age children in Cambodia, noted that television could be used as a medium to teach children about burn safety[20]. Education may ultimately increase burn prevention if the message is repeated[21] in the educational institute.

Regarding the distribution of respondents based on knowledge on different statement of burn prevention and first aid, a highest majority of respondent in most cases agreed with correct statements compared to give false opinion regarding burn prevention practices and subsequent first aid indicating that the study already perceived some alertness, as well as prevention. The associations between previously received information and current knowledge on burn first aid, it was found that there was association ($p<0.05$) between knowledge on burn prevention and practices. The similar results also documented for knowledge versus practices on subsequent first aid for burn injuries. This finding is in keeping with data from a burn prevention program carried out in Jamshedphur, India[19]. Again, the associations between current knowledge on burn & first aid and previous knowledge on the same issue according to student's class levels had comparatively better knowledge then that of their counterparts who are studying in junior grade. The above findings are consistent to the statement done by Bang, Ibrahim and Sharma where similar statement like "natural curiosity, impulsiveness, less acute perception of dangerous situations and a limited ability to react promptly and properly to the risks are the various reasons for higher vulnerability of young children"[8] has been used to compare the burn prevention knowledge of respondents.

The communication media, particularly Television is widely used by the household in Bangladesh as study result revealed that majority of the students has exposure to Television. This may be given awareness information regarding the burn prevention and its first aid so, it is important that television could be used as a medium to teach children about burn prevention and first aid. Again, it well documented that management of burn is a very costly procedure, particularly by the poor who were found vulnerable for higher incidence of burn as study revealed poverty was found as a significant risk factor for burn injuries[22]. This study also revealed that majority of respondents was intended to learning more on burn prevention and first aid from their school, which indicating Bangladesh is not exception from this kind of incidence and school students are showing interst to prevent people from this kind of accident, even from their early age. School based program mobilization and participation were identified as crucial for a successful burn injury prevention intervention at educational level as highest majority of the participants were willing to learn about this issue from school. Burn prevention is an essential part of an integrated burn management substance globally and it remains the major and probably the only available way of reducing the current state of burn morbidity and mortality[23].

Conclusion

The study results indicated that majority of the respondents had the previous knowledge of burn prevention and first aid with some variation according to their grade of schooling and majority of respondents was intended to learning more on burn prevention and first aid from their school. Burn prevention program should be designed and implemented to determine the ability of a public education program to increase awareness about burn hazards and reduce the incidence and severity of burn injuries, even special school education program could be integrated in national policy level. According to the study respondent's opinion, Television is widely used by the household in Bangladesh, which may the way to lean about the burn prevention and its first aid. It is concluded that exclusive use of mass media in burn prevention campaign could be an effective method to improve student's knowledge. Moreover, media messages should be transmitted to the school students and community interventions should be implemented in communities. This study also revealed that majority of respondents was intended to learning more on burn prevention and first aid from thir school and knowledge gains could be possible only as a result of the school program. Therefore, adequate knowledge on the associated risk factors on burn prevention and first aid those will contribute to burn causation are required for designing a burn prevention program in the community.

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