Burns Open xxx (xxxx) xxx

Contents lists available at ScienceDirect

Burns Open

journal homepage: www.burnsopen.com

Exploration of gaps and challenges in managing burn injury at district and sub-district government health care facilities in Bangladesh

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ARTICLE INFO

Article history:
Received 4 January 2019
Received in revised form 3 November 2019
Accepted 6 November 2019
Available online xxxx

Keywords:
Facility
Burn injury
Management
Bangladesh

ABSTRACT

Background: Burn injury is one of the leading cause of mortality and morbidity worldwide. In developing countries like Bangladesh, burn is one of the leading causes of illness, disabilities and deaths. More than 365,000 people are injured every year by electrical, thermal and other causes of burn injuries where 27,000 people needed hospital admission and over 5600 people died. Emergency management of burn at the facility level can reduce the severity of burn injuries and improve overall survival. The study has explored the health care providers' views on gaps and challenges in management of burn injury at the facilities district and sub district health facilities in Bangladesh.

Methodology: A qualitative study was conducted during the period in July 2015. In-depth interviews (n = 19) were performed with the doctors and nurses working in the three district government hospitals and seven sub-district (upazila) government health facilities. Thematic analysis was performed on different themes.

Results: Health care providers mentioned that the people are coming to the facilities usually, hours after the incidence. Before visiting the facilities, the burn victims mostly seek treatment from the traditional healers or form village doctors (quack) or from the local pharmacy, over the counter. Family waited until they felt that the patient may not survive. It has identified that delaying in decision making and transferring the patient to the health facility are the key challenges identified by the doctors and nurses when they attended any burn patients in their facility. Moreover, use of different traditional infectious agent in burnt areas from their home make the burn surface more damage. While as, deficiency of adequate supplies, logistics and adequate trainings for the health workers in the facility create much more difficulties to treat a burn patient at primary or secondary health care centers.

Conclusion: Burn patients are maltreated in the community before coming to the healthcare facility in most of the cases. The community has misperceptions on burn management which delay the proper management in the facility. Readiness of the facility on the other hand is a big challenge. In order to consistent in burn care in Bangladesh, its equally important to build knowledge and awareness among the community on burn prevention and their role. Like this, readiness of the facilities in time will build confidence in community, thus in turns, will save thousands of lives from burn injury in Bangladesh.

1. Background

Globally, burn injuries result in more than 7.1 million injuries causes 250,000 deaths and 18 million disability every year [1]. More than 95% of fatal burn injuries occur in low and middle-income countries [2,3] where women and children are the most vulnerable [1,4,5]. Young children are most at risk of burn injuries; hot liquids and flames are the most common causes of burn injuries at home [1,2] and rural children are more vulnerable to burn injuries than urban [5]. In many South-Asian countries, including India, Pakistan, Nepal, Sri Lanka, Afghanistan and Bangladesh, burn injuries have emerged as a major public health issue [6]. The management of burn injuries are not conducted in an efficient manner

Abbreviations: AB, Animesh Biswas; AS, Abdullah Abu Sayeed; TD, Toity Deave; KD, Koustuv Dalal; SRM, Saidur Rahman Mashreky.

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https://doi.org/10.1016/j.burnso.2019.11.002
2468-9122/

in low and middle-income countries, including Bangladesh [7]. According to the Bangladesh Health and Injury Survey 2016, for all ages, a total number of 2714 deaths were due to fire related burns [8]. In rural Bangladesh, the mortality rate for burn injuries was 21 per 1,000,000 and morbidity rates were 528 per 100,000 population [9]. The problem is more complicated because of the treatment costs for burn patients which includes specialized personnel and technologies that are not always readily available in many low income countries [4,10,11]. In Bangladesh, every year 365,000 people have burn injuries every year, of these 27,000 need hospital admission and over 5600 die [12,13]. Approximately 90% of burns occur in the kitchen at home and 89% of deaths are caused by flame burn during the winter season [6,12]. In Bangladesh, children are the most vulnerable group for burn injuries: 173,000 children suffer from burn injuries every year [6,12] and about 3400 children become permanently disabled from burns [14]. Major factors that lead to this extent of morbidity and mortality are the communities' lack of awareness about burn hazards and the lack of health seeking behaviour of the parents [15]. Burns are therefore a major cause of school absence for children.

The Ministry of Health of Bangladesh recently identified a number of key initiatives to help combat burn disasters including the development of national guidelines for the management of burns, already established a number of new burn center at the periphery medical college hospitals [16]. To ensure better management of burns, the government also fully equipped the specialized burn management center, the Burn and Plastic surgery unit, in the Dhaka Medical College Hospital and also the 500 bed World's largest burn and plastic surgery institute is close to being inaugurated [17]. The history of burn first aid shows a range of treatments that have little or no evidence to support their use. While the current recommendation by most regulatory bodies is to apply cold water for 20-minutes, others also recommend that cold water can still be effective if applied within 3 h after the burn is sustained [18]. Specialized training for the management of burns and capacity development for doctors who work in the primary health care centers, secondary and tertiary hospitals has been started but not yet achieved the required level in terms of numbers or expertise [19]. If a burn patient can be appropriately managed, initially, at the immediate health facility, it is likely that there will be a reduction in associated complications and raise the likelihood of survival. In some low and middle income countries, the Emergency Management of Severe Burn (EMSB) course is available for the doctors and nurses [20]. These EMSB courses have started recently in Bangladesh [21,20] but there is a need for full implementation at district and sub-district health facilities. This study aims to identify the gaps and challenges in the emergency management of burn injury at the district & sub-district health facilities in Bangladesh.

2. Methodology

A qualitative study was conducted using in-depth and semi-structured interviews (IDIs) with doctors and nurses in the district and sub-district government health facilities in Bangladesh where a burn unit was not available. The study carried out in the month of July 2015. This qualitative research technique has a considerable advantage because it enables the exploration of the participant's perspective on a particular situation [22].

For this study, three districts, Narail, Bagerhat and Netrakona, were selected. Within these districts, all three district (sadar) hospitals and seven randomly selected upazila health complexes (UHCs) were included. The seven UHCs include Lohagora UHC in the Narail district, the UHCs of Rampal, Mollahat and Kachua Upazilas in the Bagerhat district and the UHCs of Durgapur, Purbadhala and Mohongonj Upazilas in the Netrakona district. A total of 32 doctors and nurses who had experienced of burn injury management in their health facility were randomly selected and invited to participate in this study, of whom 19 agreed to take part. Of them, in-depth interviews (IDIs) were conducted with eleven doctors and eight nurses using an interview schedule that had been pretested (Table 1).

Table 2 an anthropologist was assigned to assist the principal investigator and co-investigators to develop the interview schedule and this was pretested in the field before actual data collection. The interview schedules with relevant prompts were finalized in a technical meeting with the support of professional experts. The interviews were undertaken by one of two research officer who were appropriately trained. Interviews were audio-recorded following the consent of the respondent, key notes were taken and they lasted between 20 and 30 min. Each interview was transcribed verbatim by the two research officers, any identifiable information was removed from the transcription and each participant was allocated a unique identification number. A total number of nine IDIs transcriptions were checked by the anthropologist to ensure the quality of the transcription. The transcripts were translated from Bengali to English by the research officers.

During the data collection period research investigators involved in the research visited and observed the data collection procedure of this study. An anthropologist trained in qualitative research monitored and supervised the data collection process. Data analysis was undertaken by the two researcher officers who examined the transcripts and a number of open codes were identified [23]. Selective coding of the data was then performed and codes were grouped into categories under each theme [24].

3. Results

The results are presented and described by theme. The doctors and nurses who were interviewed had no special training on burn injury management rather they practised to treat the normal burn injured patients. The doctors and nurses were at the age range from 25 years to 52 years. Among them 12 were female and 7 were male. They have the experience in providing burn care is from 1 year to 22 years. General information includes the participants talked about in relation to burns and burn injuries are described below.

The participants reported that the majority of patients admitted to hospital with a burn were women and children and their injuries usually happened while they were cooking or keeping up the fire during cooking. Majority of the patients were women and children of the rural areas. Burn injuries usually happened while they were cooking or keeping up the fire during cooking.

All of the participants said that, where they work, up to 30% of admissions were due to burn injuries but that, if the injury was severe, they would refer them immediately. Without a separate burn unit in their health facility, they reported that it was difficult to prevent these patients becoming infected. The participants highlighted that the drugs available in their facilities were only for managing simple burns and not severe injuries. Rural populations are mostly dependent on the traditional health care providers like the kabiraj (traditional healer) and village doctors. Traditionally, they also use egg yolk, mud, coconut oil, cow dung, soil and toothpaste, all of which complicate the correct management of the burn injury when they reach a health facility. The doctors and nurses emphasized the need for mass awareness and training on the emergency management of burn injury.

4. Practices and conditions of the burn patients

The participants reported that the rural population tends to delay going to a health facility due to their dependency on village

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Table 1
Participants who undertook an in-depth interview.

Types of facilities	No of IDIs	Participants	Gender	Mean years of experiences	Age Range
District Hospital (03) Upazila Health Complex (07)	19	Doctor (11) [P1-P11] Nurses (08) [P12-P19]	Nine Male and two female All are female	07 years 15 Years	28–38 years 25–52 years

Table 2
In-depth interview schedule.

Area of discussion	Types of Prompts used
Condition of burn injured patient at facility	Common Practices at home before came at facility – What people normally do immediately after burn injury? Where and from whom they usually first seek health care? Duration to reach facility after burn- delay to come at facility after burn and causes of delay. Condition of patient during admission- What are the types of burn patient at hospital? What complication of burn patients? Severity & Degree of burn come at facility.
Management of burn injured patient at facility	How to manage the burn injured patient? Either provides treatment any burn injured patient. Either receives any training on burn injury management. Facilities at hospital for burn injury management Process of referral of burn injured patient
Gaps and Challenges	What are the challenges to manage burn injury at facilities? Factors that hinders the management of burn injury at facility
Recommendation	Necessity of training and logistics for emergency management of burn injury How to disseminate the exact knowledge on burn injury among community people?

doctors and kabiraj. The rural people are not aware and have misperception and malpractices about pre-hospital first aid. They depend on village doctors and kabiraj after burn injury. They normally do not run water over the wound because they think that water may cause more damage to and increased the pain at the injury site.

Those who reside close to the health facility visit the facility immediately after the burn has happened but the residents who live far away from the health facilities delay attending for two to three days after the burn occurred.

> *"People first try to receive traditional treatment by themselves at community. They apply egg, toothpaste, rotten banana, mud, soil, sugar, salty water, mobil, coconut oil at the wound area for reducing pain. They use these with the advice of village doctors and kabiraj.*"- P5, IDI, Doctor of a UHC

The patients usually delay going to a health facility. The most common factors are negligence, ignorance, unawareness, misperception, malpractices, dependency of traditional healer, and distance of health facilities. Those patients who reside close to the health facility visit the facility immediately after the burn has happened but the residents who live far away from the health facilities delay attending for two to three days after the burn occurred. They normally do not run water over the wound because they think that water may cause more damage to and increased the pain at the injury site, as described below:

> *"Community people avoid applying water at the injured area as they think water may cause more complication of the injury. They wrap the wound with hair by kabiraj as they believe it may diminish injury.*" – P12, IDI, Nurse of a UHC

They also believe some superstitions for treatment of burn injury. Patients have been reported to have arrived unconscious, in unstable condition and sometimes with severe pain in the injured areas. In the sub-district health facilities, there were no separate areas for treating and managing burn patients. The participants reported that there were not even skilled doctors or nurses with very limited essential dugs and logistics. District health facilities were reported to be in better conditions than the sub-district health facilities in term of skilled manpower, logistics and access to essential medicines.

> *"People first try to receive traditional treatment by themselves at community. They apply egg, toothpaste, rotten banana, mud, soil, sugar, salty water, mobil, coconut oil at the wound area for reducing pain. They use these with the advice of village doctors and kabiraj.*" – P2, IDI, Doctor of a Sub-District Hospital

> *"Community people avoid applying water at the injured area as they think water may cause more complication of the injury. They wrap the wound with hair by kabiraj as they believe it may diminish injury.*" P18, IDI, Nurse of a Sub-District Hospital

5. Management of the burn injuries at the health facility

In 2015 a total of 135 patients received treatment from the seven upazila health complexes and three district Sadar hospitals of the three selected districts in the current study. There is no separate burn unit in these facilities. In most cases the patients came with below 30% of burn injury and with the 1st degree severity of burn. But second and third degree of burn also came. A total of 36 patients were referred from these facilities in 2015. The patients who were admitted in hospital were treated with the other patients. The only emergency management can be provided in these district and sub-district facilities. These facilities are not common in all sub districts facilities. In such cases the patients were referred to district facilities immediately after admission. The common problem in both types of health facilities was reported to be the delays of the rural population make reaching hospital post-injury, as illustrated by one of the doctor's comment below:

> *"Community people made delay to take burn injured patient at facilities. They firstly depend on the traditional healer where the cases become more complex with malpractices. Then we have nothing to do without referral.*" – P11, IDI, Doctor of a District Hospital

6. Gaps and challenges

There were no burn units in all of the facilities. In the health facilities where the participants worked, there were no staff specifically trained on burn injury management. The doctors or nurses had no training on burn injury management and there were very limited essential dugs and logistics in the health facilities. The common problem in the health facilities was reported to be the delay of the rural population reaching hospital post-injury. In the sub-district health facilities, there were no separate areas for treating and managing burn patients. District health facilities were reported to be in better conditions than the sub-district health

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facilities in term of skilled manpower, logistics and access to essential medicines. The supply of essential drugs and logistics were not sufficient to support the management of severe burn injured patients at these facilities.

> *"There is only burn ointment and fluid available in the facility. Only primary care with antibiotics, pain killer and antiseptics can be used for burn injury. No surgery occurs in the hospital for burn injury as limitation of skilled manpower and also operative instruments.*"- P9, IDI, Doctor of a UHC

As reported above and described by the doctor working in a secondary level hospital, there were no separate units for burn injured patients and therefore wound infection is more likely.

> *"There is no separate burn unit in our hospital. So we can't provide the special care for burn injured patient. Moreover, there are lack of essential logistics and skilled manpower for emergency management of burn injury. We have no specialized trained doctors and nurses on burn injury management.*" P2, IDI, Doctor of a District Hospital

In respect of the assessment of the severity of burn injuries, all the doctors could recognize the severity of burns but nurses had limited experience and knowledge about assessing the severity of a burn injury. Some participants mentioned the need for strengthening the ability of staff working in community clinics so that they could assess and provide primary treatment for burn injuries.

All of the doctors and nurses emphasized the importance of training about correct emergency burn management. They also stressed the importance of raising awareness of correct burn first aid in rural communities, and the importance of immediate transfer to healthcare facilities, with the aim of changing the use of traditional treatments and people's dependency on traditional healers.

> *"The community people should apply sufficient water immediately after any burn injury and then immediately transfer the patients to the facility for emergency management.*" – P7, IDI, Doctor of a UHC

The use of advertising (or public campaigns) through the use of posters, television, social media publicity and home visits by health workers to raise awareness about correct burn first-aid should improve outcomes. The comment below by one of the nurse participants stresses the importance of raising awareness:

> *"Pestering, leaflet distribution, awareness of the meeting with community people about burn injury is mandatory. Even demonstration with appearing burn injury at courtyard meeting with emergency management can make a social mobilization about the changes of their traditional believe and practices.*"- P19, IDI, Nurse of a District Hospital

7. Discussion

This study set out to explore the gaps and challenges in the management of burn injuries at district & sub-district health facilities in Bangladesh that did not have a separate burn unit. Eleven doctors and eight nurses were interviewed the main aspects that they highlighted were the need for correct management of burn injuries in the community, burn first-aid; the importance of not delaying attending a health care facility post-burn, the lack of both skilled staff trained in the management of burns and separate areas in which to care for burn patients, and the need for access to essential medicines and logistics. Rural populations often worsen the injury by giving incorrect treatment; they depend on the traditional healer in their communities and, only lastly, do they decide to go to a health facility, usually after a significant delay.

Once the patient arrives at the health facility, the delay and incorrect treatment of the burn will have complicated the management of the burn, thus making it more difficult for the doctors and nurses at district and sub-district health facilities to manage the patient. Moreover, they have limited training, facilities and essential medicines with which to manage the burn injuries. Since the first hour of burn is called the 'golden hour', emergency management within this time can save numbers of lives, minimize the severity of a burn and reduce the duration of hospital stay in Bangladesh [19]. Burns are one of the main causes for hospital admission and are the reason for the longest hospitalization compared to other condition [14]. Burns also cause a huge economic and social burden for the patient and their families. Whereas the prevention and control of burn injury and proper immediate proper management of burn injured patient at community can reduce this burden [14,25].

Common practices for burns used by those living in rural communities are raw eggs, rotten part of banana trees, repeatedly soaking the wounds and applying ice to cool down the burn [26]. Moreover, practiced by these communities for burn injuries also include pasting the area with mud, toothpaste, onion, raw potato mash, coconut oil, kerosene oil, or a mixture of limewater and coconut oil. They also use different herbal medicines made from leaves of herbal plants like sesame oil, sesame oil and wax together and juice of the 'kapila' leaves, even a mixture prepared by boiling milk to avoid scarring of the wound. To reduce the risk of infection, they believe it is helpful to apply heat to the burn wound [26].

For treatment, firstly they depend on the kabiraj but, after that, if the burn is not better, then the patient is taken to a qualified doctor. Previous research has found that, for a burn to a child, around 60% of parents seek health care from unqualified service providers but the parents with higher income group and educated choose qualified service providers [27]. The findings of this current study have policy implications for the management of burn injuries: it has identified the need to change various practices for managing burn injuries at the community level.

The treatment of a severe burn injury is long, painful and more costly than treating other injuries. In low income countries, burn injuries are seen as complicated health problems because the medical care needed requires specialized staff and technologies that are expensive and not always readily available. Burns are associated with longer hospital stay, permanent disability and emotional stress as well as creating an economic burden on the family as they disrupt the ability of family members to work [25,28].

Raising awareness in the wider population about correct first-aid and treatment of burns, together with the need for skilled manpower, essential medicines and efficient logistics at health facilities are essential for the management of burn injuries. Changing the perception and practices on immediate burn injury management at community is essential. Training on the management of severe burns for both doctors and nurses would reduce the barriers to treating burn injuries at district and sub-district government health facilities in Bangladesh [19].

8. Conclusion

Immediate and correct first-aid in the community, and treatment in a health facility, is essential for burn patients. These will play a vital role in preventing disability from burn injuries and will save the time and money of the patients and their families. Rural communities need to know about and understand the importance of taking people with burn injuries to a healthcare facility without delay. Healthcare facilities are the only place where burn patients

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should be managed. The healthcare facilities themselves need the relevant equipment, medicines and logistics and the doctors and nurses should be trained in the management of burns. If burn patients can be managed immediately and correctly at healthcare facilities, the extent of disability, morbidity and mortality rates will decrease. A strong referral system is needed in district and sub district facilities. However, severe burns and burn patients with complications will always have to be referred to tertiary facilities for appropriate management. An intervention research can be designed in the rural areas to address the role of awareness and pre-hospital first aid in decreasing the morbidity for burn injuries. The Ministry of Health and Family Welfare of Bangladesh can play a vital role through developing and implementing guidelines, training of the health professionals, the availabilities of logistics and modifying the infrastructure of the facilities to ensure proper management of burn-injured patients.

9. Limitation

The study was conducted in only three districts selected facilities, which may not reflect the whole country's situation due to low coverage. The study had to rely on qualitative data obtained from IDIs, whereas FGDs could give further opportunity to explore in-depth. Moreover, quantitative data could also supplement qualitative findings. The study included doctors and nurses for interviews, whereas other health care providers in the facility including the midwives, patients and their caregivers could provide extended information which was not possible due to lack of funding support and time constraints.

10. Strong points

A clear concept of the facility readiness on managing burn-injured patient explored in this study. Whereas, it also observed contextual difference in health care delivery for burn between district and sub-district facilities. Moreover, it clearly outlined the challenges persist in the district and sub-district level facilities for burn management which will direct the planners and policy-makers to design burn management plan in those level.

Declarations

Ethical approval and consent to participate

The ethical permission for the study was provided by the Ethical Review Committee of the Centre for Injury Prevention and Research, Bangladesh. Written consent was obtained from each participant prior to participation in the FGDs. The right of withdrawal from the study was emphasized. In cases of minors (under 18 years), written consent was taken from their parents or guardian prior to the focus group. The whole project has financial support of the Bangladesh Medical Research Council (BMRC).

Availability of data and material

The datasets generated during and/or analysed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

We are grateful to Bangladesh Medical Research Council, Bangladesh for funding the research. We are also thankful to Interplast Australia & New Zealand for funding support to publish the manuscript.

Authors' contributions

AB & SRM planned and designing of the study. AB, AS and SRM participated in the implementation and analysis. Anthropologist in the study responsible for data collection, transcription and transplantation who not participated directly in the manuscript. KD and TD participated in the analysis and provided input in the results section. TD edited the english of the manuscript. All authors wrote the paper. All authors read and approved the final manuscript Acknowledgements

We would like to acknowledge the communities who actively participated and shared their views and comments. I Animesh is first author, Koustuv is one of the co-author in this article. We also like to acknowledge that Professor Koustuv Dalal, PhD is the Section Editor of the Quality, performance, safety and outcomes section of BMC Health Service Research and Dr Animesh Biswas, PhD is an Associate Editor of the same journal.

Authors' information

The authors have been involved in research activities in public health research, especially in injury prevention, for last eleven years in Bangladesh and the UK.

Consent to publish

Not applicable.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.burnso.2019.11.002.

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