

## Original Research

# First aid practices, beliefs, and sources of information among caregivers regarding paediatric burn injuries in Harare, Zimbabwe: A cross-sectional study

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### Abstract

#### Background

While burns take seconds to occur, the resulting injuries result in pain and undesirable long-term (often lifelong) effects. The study was carried out to determine the practices, beliefs, and sources of information related to burns and first aid among caregivers of children who present to hospital with burn injuries in Harare, Zimbabwe.

#### Methods

A cross-sectional study was carried out over a period of 3 months at 2 central hospitals in Harare (Parirenyatwa Group of Hospitals and Harare Central Hospital). A questionnaire was administered to the caregivers of children, aged 0 to 60 months and admitted to the burns wards, to elicit information on the circumstances of the burn injury and the first aid methods which were administered.

#### Results

Out of the 50 children who were recruited, 54.0% were females and the mean age was 29.5 months (SD = 15.5). As first aid for the burn injuries that brought these children to hospital, 30 (60.0%) of the caregivers cooled the burn with cold running water. Some caregivers applied eggs, margarine, or traditional herbs as first aid. Other first aid practices reported by the caregivers included the use of urine and crushed cockroaches (n = 40; 80.0%), while 20 caregivers (40.0%) used aloe vera gel. About half of the caregivers received first aid information mainly from family members and very few indicated that the information was obtained from mass media (n = 3; 6.0%).

#### Conclusions

The first aid measures used by the majority of caregivers were either incomplete or inadequate. Although some caregivers had adequate knowledge of what to do after an injury, there still was widespread use of alternative therapies in burn management.

### Introduction

Burns remain a significant cause of injury in the paediatric population worldwide despite the advancement in treatment of affected patients, as reflected by a decrease in morbidity and mortality associated with these injuries.<sup>1</sup> Burn injuries have been reported to be high in children below the age of 14 and the incidence is particularly high in infants and toddlers, especially during the winter season.<sup>2,3</sup> In Zimbabwe childhood burn injuries have emerged as a major public health problem,<sup>4</sup> as noted in the other developing countries as well. First aid is emergency care or treatment given before regular medical aid can be obtained and it must be readily available, easy to use by the general public and not hinder professional examination or treatment of the wound at a later date.<sup>5</sup> First aid after burn injuries should aim at providing analgesia and ideally halt the progression of injury. Appropriate and complete first aid given to the child immediately after injury is associated with significantly reduced re-epithelialisation time for children with contact burns and results in positive clinical outcomes in the children at discharge from the hospital.<sup>5</sup> The benefits of implementing the appropriate first aid treatment after a burn injury include; halting the progression of the burn, removing any noxious agents, providing pain relief and reducing oedema and increasing the rate of wound healing by promoting the rapid growth of epithelial cells.<sup>5</sup> The recommended first aid treatment after a burn injury includes stopping the burning process, removing clothes or jewellery near the burnt area, cooling the burn for 10 to 30 minutes with cool or lukewarm water, keeping

the patient warm, covering the burnt area with cling film, giving analgesia as well as seeking professional help.<sup>6</sup> Use of inappropriate first aid measures is associated with infection as some of the items used are non-sterile and promote bacterial proliferation on the surface of the wound and use of ice or iced water leads to vasoconstriction which lead to hypothermia especially in children.<sup>5</sup> Use of aloe vera has also been shown to be associated with significantly delayed wound healing and use of oils, vaseline, fats, flour, powdered chalk and creams which was believed to form effective air barrier was not beneficial and made secondary treatment by the doctor or surgeon more difficult.<sup>5</sup> The aim of this study was to determine the measures of first aid delivered by caregivers in Harare, Zimbabwe after a burn injury and the sources of the information.

### Methods

A descriptive cross sectional study was done at Parirenyatwa Group of Hospitals and Harare Central Hospital over a period of 3 months in the paediatrics burns wards. The 2 hospitals are the largest government hospitals in Harare and have also specialised burns units for major burns admission. The admission criteria for the hospitals are as follows: any burn affecting greater than 10% of the total body surface area (TBSA), children with 8% to 10% burns or more, burns of special regions like face, neck, hands and feet, perineum and joints irrespective of TBSA, circumferential burns, electrical, lightning and chemical burns, lesser burns associated with inhalational injury, significant pre-existing medical disorders and very young patients or suspected abuse. The majority

**Table 1: Sociodemographic characteristics of the children who sustained burn injuries and their caregivers (N = 50)**

<b>Mean child age (months) ± standard deviation (SD)</b>		29.5 ± 15.5
<b>Child gender n (%)</b>	Male	23 (46.0)
	Female	27 (54.0)
<b>Caregiver relationship to child n (%)</b>	Mother	39 (78.0)
	Parents	6 (12.0)
	Grandmother	5 (10.0)
<b>Caregiver marital status n (%)</b>	Married	42 (84.0)
	Formerly married	8 (16.0)
<b>Residential area n (%)</b>	Urban	30 (60.0)
	Periurban	12 (24.0)
	Rural	8 (16.0)
<b>Caregiver educational level n (%)</b>	Primary	5 (10.0)
	Secondary	38 (76.0)
	Tertiary	7 (14.0)
<b>Caregiver employment status n (%)</b>	Unemployed	22 (44.0)
	Formally employed	17 (34.0)
	Informally employed	11 (22.0)
<b>Mean household members n ± SD</b>		5.04 ± 1.9

**Table 2: Burn characteristics, supervision, and complications (N = 50)**

	<b>Characteristic</b>	<b>Frequency</b>
<b>Cause of burn n (%)</b>	Scald	22 (44.0)
	Flame	14 (28.0)
	Contact	14 (28.0)
<b>Time of burn n (%)</b>	Morning (0:00 to 11:59)	16 (32.0)
	Afternoon (12:00 to 17:59)	10 (20.0)
	Evening (18:00 to 23:59)	24 (48.0)
<b>Primary supervisor n (%)</b>	Mother	35 (70.0)
	Sibling	2 (4.0)
	Relatives	8 (16.0)
	Housekeeper	5 (10.0)
<b>Complications n (%)</b>	Contractures	11 (22.0)
	Wound infection	14 (28.0)

of the children admitted in the burns ward would have sustained burns of special regions irrespective of the TBSA. The children admitted in the burns wards are patients with moderate burns, as severe burns will require long term special care and should be managed in a suitable specialised burns units in the respective hospitals. Children in the age group of 0 to 5 years admitted in the burns wards in the 2 hospitals and their caregivers were recruited to participate in the study. Caregivers of the children consented to take part in the study and to have data relating to their children accessed. Ethical approval was obtained from the Joint College of Health Sciences and Parirenyatwa Group of Hospitals Research Ethics Committee (JREC Ref: 381/14) and the Institutional Review Boards of the 2 hospitals.

Collection of data was via a researcher-administered questionnaire with a total of 22 questions. Information was gathered through interviewing the caregiver as well as review of patients' notes and examination of the patient. For the purpose of the study, the caregiver was defined as the individual who spent most of the time with the child

overseeing the child's care during the child's admission. The questionnaire had 3 sections which included the demographic section eliciting information on the child's age, gender, place of occurrence of the burn injury, caregiver's gender, level of education, marital status and employment status. The last section collected information on the burn history which included: cause, severity, individual who was supervising the child on the day of the injury, complications which resulted and the first aid or home based treatment administered to child at home when the burn injury occurred. Some other first aid practices which the caregivers had heard about but not necessarily have used when the burn injury occurred where documented. The first aid treatment was defined as appropriate or inappropriate based from review of articles which highlighted the best first aid measures to be encouraged and measures which were deemed inappropriate.<sup>5-7</sup>

**Results**

***Demographics of children and the caregivers***

Of all the children with burns, 23 (46.0%) were males and 27 (54.0%) were females. Their mean age was 29.5 months (standard deviation, SD = 15.5). Most of the children and their caregivers, 30 (60%) resided in urban areas and only 8 (16%) were from the rural areas. The majority 42 (84.0%) of the caregivers were married.

Of all the caregivers, 45 (90.0%) were either one of the parents but mostly the mother. A total of 38 (76.0%) caregivers had a highest level of education of secondary level and 7 (10.0%) studied up to tertiary level. The majority, 22 (44.0%) of caregivers were unemployed and 17 (34.0%) were formerly employed. Most of the households (n = 43; 86.0%) that the caregivers came from contained 0 to 7 people, with the mean household size being 5.0 ± 1.9 people (Table 1).

***Burn characteristics, severity and complications***

The main cause of burns in this cohort was scalding, 22 (44%). Most of the burns occurred in the evening (1800-2400hrs) while the child was under the mother's supervision. Burn TBSA ranged between 1% and 28%, with a mean of 8.9 % (SD = 7.1), and the complications which developed in half of the children were wound infection and contractures (Table 2).

***First aid administered by caregivers and sources of first aid information***

There were 10 caregivers (20.0%) who did not provide any form of some first aid to the children when the burn injury occurred. Eighteen (36.0%) of the caregivers only used 1 method, and 22 (44.0%) used more than 1 method of first aid. Among the 22 caregivers who reported to have used more than 1 method of first aid, 13 (52.0%) of their children developed complications, and infection was the most common complication (n = 9; 36.0%). From the 10 caregivers (20.0%) who did not use any form of first aid, 6 (24.0%) children were reported to have developed complications, with infection being noted in 1 child. The number of first aid methods used did not significantly affect the presence or number of burn complications (P = 0.12 [Fisher's exact]). The majority of the caregivers (n = 30; 60.0%) cooled the burn injury with cold running water. Some caregivers also applied eggs, margarine and some traditional herbs as first aid (Table 3). In terms of how choice of first aid method was associated with the development of complications, children who received inappropriate first aid were significantly more likely to develop infections (X<sup>2</sup> = 29.848; P < 0.001).

Apart from the first aid methods highlighted on the questionnaire, the caregivers also indicated other methods. The common practices included use of urine and crushed cockroaches after burn injury in 40 (80.0%) of the participants. Others reported use of aloe vera gel (n = 20; 40.0%), Gentle magic® “skincare serum” (n = 16; 32.0%), flour (n = 10; 20.0%), and lotions like camphor cream (n = 9; 18.0%). About half of the caregivers reported receiving information regarding first aid from at least 1 source, mainly from family members and friends; few indicated that information was obtained from mass media (n = 3; 6.0%) (Table 4).

**Discussion**

First aid of burns reduces the severity and depth of tissue damage and improves outcomes, including a reduction in hospitalisation time and surgical intervention.<sup>5</sup> It therefore becomes very important for the population with a high burden of burns, to be well informed about the appropriate and effective first aid measures to be done following a burn injury.

From the published work, the current recommendations for the first aid treatment of burn injuries should be to use cold running tap water (between 2°C and 15°C) on the burn, not ice or alternative plant therapies.<sup>5</sup> Basing from these recommendations and results of our study, it shows that the knowledge of first aid in burns is poor among the caregivers. Some caregivers had some knowledge on the appropriate first aid treatment methods to be used while others had no knowledge at all as the first aid methods they used were contraindicated. This correlates with the findings from some studies done in the United Kingdom which concluded that knowledge of burns first aid among parents is inadequate and correlates with lower socioeconomic groups.<sup>6,7</sup>

It is not certain whether some of the alternatives therapies used for burns do not cause some of the complications. Our results showed a significance association between use of inappropriate methods, especially use of ice, eggs, margarine, traditional herbs and development of infection as a complication in the children. The other methods the caregivers also highlighted to be the other methods they know, it cannot be proved if they did not actually use them on the burn injury their children sustained. The methods used by the caregivers were easy to use and readily available to the general public but it is not certain whether these methods do not hinder professional examination and/or treatment of the wound at a later date. Alternatives therapies such as plant herbs, margarine and were given to provide analgesia whereas; aloe vera gel was reported to decrease inflammation. Gentle magic skincare serum and crushed cockroaches were reportedly applied to improve the resultant scar post burn injury. Similar alternative therapies have been reported as common practice after a burn injury in other

**Table 3: First aid measures administered by caregivers (N = 50)**

First aid measures delivered by caregivers	Yes n (%)	No n (%)	X <sup>2</sup> statistic*	P-value*
Cooled the area with running water	30 (60.0)	20 (40.0)	5.811	0.050
Ensuring own safety and removal of heat source	16 (32.0)	34 (68.0)	2.583	0.27
Proper positioning of the child	8 (16.0)	42 (84.0)	0.697	0.71
Application of cold water towel and vaseline	9 (18.0)	41 (82.0)	0.790	0.68
Removal of clothes sticking to the body after burn injury	10 (20.0)	40 (80.0)	0.915	0.63
Breaking of the blisters and removal of peeled skin	7 (14.0)	43 (86.0)	0.789	0.67
Application of ice, eggs, margarine and traditional herbs	17 (34.0)	33 (66.0)	23.064	0.0001

\*Association between the first aid method used and the complications which developed in the children

**Table 4: Sources of first aid information for caregivers (N = 50)**

Primary information source	Frequency (%)
Books	6 (12.0)
School	5 (10.0)
Internet	11 (22.0)
Mass media	3 (6.0)
Family member	25 (50.0)

African countries like South Africa and Nigeria.<sup>8,9</sup> The other alternative therapies which were reported from South Africa and Nigeria but not common in caregivers in our study were pap, chalk, cow dung and salt. It was also noted that even in some European countries like Turkey and the United Kingdom, inappropriate methods were popular after a burn injury and these included yoghurt, toothpaste, tomato paste, ice, chalk, raw egg whites, or sliced potato.<sup>6,10</sup> It is indicated that preventing exposure to air after a burn injury alleviates pain and reduces further damage<sup>5</sup>; this intended outcome could account for some of the behaviours observed in some caregivers who ended up applying margarine, lotions and flour on the burn site.

The information about practicing the appropriate methods of first aid after burn injury have to be communicated to all caregivers as some caregivers were not aware of the benefits or harm of each method. It is therefore important for all the caregivers to be informed of the appropriate practice to do following a burn injury and the associated benefits. The source of first aid information after a burn injury was also seen to vary. Caregivers in urban areas have access to television, radio and internet therefore, they are most likely to be aware of the appropriate measures to be done if any campaigns or audio presentations are done on burn management. On the contrary, caregivers from rural areas do not have access to mass media hence they rely more on the information from local people. Some have to travel very long distances to the nearest clinic or hospital but they can easily get help from traditional healers who usually reside

within easy reach of general populace. Traditional healers and older relatives will promote use of plant therapies after a burn hence plant therapy becomes the common method of treatment following burns in rural areas. In the case of rural areas, the village health workers have to be fully utilised so that they can deliver frequent burns management campaigns for the local people and also the traditional healers and the health professionals have to work together in order to provide the best treatment to people which is not detrimental.

### Conclusions

The first aid methods used by the caregivers were either incomplete or inadequate. Although some of the caregivers had adequate knowledge of what to do after an injury like cooling the area over running water, there was widespread use of alternatives therapies in the management of the burns and source of the information was mainly from a family member.

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### Competing interests

All authors declare that they have no competing interests related to this work.

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