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# Knowledge, attitude, and belief regarding burn first aid among caregivers attending pediatric emergency medicine departments



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## ARTICLE INFO

### Article history:

Accepted 24 March 2016

### Keywords:

Burn  
First  
Aid  
Knowledge

## ABSTRACT

**Background and objectives:** Emergency departments witness many cases of burns that can be prevented with various first-aid measures. Immediate and effective burn first aid reduces morbidity and determines the outcome. Thus, it is imperative that measures of primary burn prevention and first-aid knowledge be improved. This descriptive study determines the current level of knowledge, attitude, and belief regarding burn first aid among caregivers.

**Materials and methods:** Caregivers attending four pediatric emergency departments answered a structured questionnaire for demographic information, knowledge, and the burn first aid they provide including two case scenarios. Applying cold water for 15–20 min, smothering burning clothes, and covering the pot of oil on fire with a wet cloth were considered appropriate responses. The main outcome measure was the proportion of caregivers who were aware of burn first aid and did not use inappropriate remedies. Additional questions regarding the best means of educating the public on burn first aid were included. Individual chi-squared tests and univariate logistic regressions were performed to correlate knowledge with demographic features, history of burns, and first-aid training.

**Results:** The 408 interviewed caregivers (55% women) reflected a wide range of age, occupation, and educational level. Sixty percent (60%) of respondents had a large family, with 52% reporting a history of burns. Overall, 41% treated burns with cool or cold water, although 97% had inappropriate or no knowledge of the duration. Further, 32% treated burns with nonscientific remedies alone or in combination, including honey, egg white, toothpaste, white flour, tomato paste, yogurt, tea, sliced potato, butter, or ice. Only 15% had first-aid training. While 65% of caregivers covered a pot of oil on fire with a wet cloth, only 24% reported smothering burning clothes. Participants preferred learning more of first aid for burns via social media (41%), hospital visits (30%), and television (TV) (16%). No significant correlation was found between age, family size, language, history of burns, or training and knowledge; however, female gender and higher educational level were associated with increased awareness, although this was not statistically significant ( $p = 0.05$  and  $p = 0.17$ ,

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<http://dx.doi.org/10.1016/j.burns.2016.03.019>

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respectively). The logistic regression accounting for all significant variables showed that the history of burns had the greatest effect on knowledge of first aid ( $p < 0.03$ ).

**Conclusion:** Knowledge of burn first aid among caregivers is limited, with many resorting to non-scientific remedies. Use of social media, hospital visits, and TV for first-aid education might improve caregivers' awareness. A nationwide educational program emphasizing first-aid application of only cold water and reduced use of inappropriate home remedies for burns is recommended.

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## 1. Introduction

Burns are a common preventable form of trauma prevalent worldwide [1]. In Saudi Arabia, 0.3% of the population are known to be affected [2–4]. Although the country has several burn units, the exact magnitude of this public health concern has not been fully reported because of the lack of a national burn registry. Several causes of burns have been described: hot water from the water heater during winter season, habitual drinking of coffee and tea directly from hot pots, and cooking with hot oil mostly during the holy month of Ramadan. Many parts of the body are involved [5–10].

Immediate and effective first aid after burns significantly determines the outcome, ensuring that tissue damage and subsequent morbidity is limited, as is the use of skin grafting [11,12].

Applying cold running water at a temperature between 2 and 15 °C for 20 min is considered an appropriate first-aid response to all kinds of thermal burns [13–16]. This application is ideal within the first hour of injury and effective up to 3 h from the time of injury [17,18].

Many studies have shown low awareness of first aid of burns in both developed and developing countries [19–25]. However, very few reports of burn prevention programs have been implemented in Saudi Arabia [26].

Our experience treating burn patients suggested that a significant proportion of caregivers (family members) were not fully aware of burn prevention and initial treatment. This observation underscores the importance of primary burn prevention and increased awareness.

The aim of this study was to determine the knowledge, attitude, and belief regarding first aid for burns in a major city as baseline information to develop an effective burn prevention program in Saudi Arabia.

## 2. Materials and methods

A customized survey was distributed to the caregivers of children attending four major tertiary and teaching pediatric emergency medicine departments (PEMDs) in Riyadh. The emergency department (ED) was selected to represent a range of socioeconomic strata. Participants were randomly selected to match the investigators' schedule, which was randomly distributed, including morning, evening, and night shifts. The permission of the ED director and consent of the participant

were obtained verbally, and pediatric emergency fellows administered the surveys.

### 2.1. Development of questions

A suitable survey was selected and the questions were developed in steps (Fig. 1) [27].

### 2.2. Timeline and sample size

The study was conducted over 6 months. In a previous study [28], 39.6% reported applied only cold water to burns. We used this percentage as an indicator of burn first-aid knowledge among the population and entered it in the calculation of the required sample size. The calculated sample size needed was 367 subjects based on 95% confidence level and probable error of 5%. Given that some participants may have withdrawn, the sample size was increased to 400 participants.

### 2.3. Inclusion and exclusion

Parents visiting the PEMD with children with non-burn-related illnesses/injuries were included.

Non-Arabic-speaking respondents were aided by translators. Participants not providing informed consent were excluded.

### 2.4. Statistical analysis

Data were analyzed using SAS, version 9.3 (SAS Institute Inc., Cary, NC, USA).

Descriptive statistics for the categorical variables were summarized as percentages and frequencies, and then compared via the chi-squared test.

Univariate logistic regression was used to study the effect of the factors on the knowledge of burn first aid. The level of statistical significance was set at  $p < 0.05$ .

### 2.5. Participants information and consent

Participants were informed that this study aimed to assess the knowledge of first aid for burns in Riyadh as baseline information to develop an effective burn prevention program in Saudi Arabia. Participants were asked about their burn experience, use of first aid, and the best means of conveying the initial management and prevention program. At the

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