

LETTER TO EDITOR

Importance and Obstacles of First Aid in Burn Injuries; A Letter to The Editor

Farzan Madadzadeh¹, Golnaz Afzal^{2*}

1. Center for Healthcare Data Modeling, Departments of Biostatistics and Epidemiology, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

2. Department of Clinical Pharmacy, School of Pharmacy, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

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Dear Editor,

Burns are a global public health problem, which include damages to body tissues caused by heat, radiation, chemicals, or electricity, and are called scalds if caused by hot water or steam. Burns and scalds can range from a minor injury to a life-threatening emergency that requires intensive care unit admissions and multiple surgical interventions, excision, and skin grafting (1). After a burn injury, pre-hospital care, which includes first aid measures before transfer to a burn center, is considered to be a significantly important step in the process of burn treatment (2). In addition, individuals who receive medical care at a hospital following initial first aid administered at home experience a better outcome (3).

Appropriate first aid is an essential part of the immediate medical management of burns, aiming to reduce the severity of the tissue damage and morbidity of burns. However, a small number of burn victims received optimal burn first aid (4). Many nonscientific remedies alone or in combination are lauded by the patients as first aid, from home remedies to natural and folk remedies (5). For example, the common pre-hospital treatments for burns include a wide range of inappropriate products, and potentially harmful first aid such as the application of natural plant therapies, ice, yogurt, oils, honey, raw egg white, tomato paste, or butter are applied directly to the burn surface (6). Many of these traditional remedies are self-perpetuating and generational unless interventional education is provided (7). Additionally, burn surfaces are characterized by high susceptibility to bacterial infections, using these non-sterile substances could potentially introduce contaminants to the wound.

Some of these remedies can create a film or crust, similar to what occurs with toothpaste and yogurt, leading to increased discomfort during wound cleaning (8). Toothpaste may trap heat and slow down the cooling process and recovery of the burn. Moreover, the whitening agents present in toothpaste

can irritate the skin and lead to lasting skin discoloration (4). Additionally, there are several nonscientific remedies and advice received from non-evidence-based health-related websites, which leads to the dissemination of inappropriate or harmful methods (9).

For example, incorrect information and improper use of folk remedies recommended by Martin in 1886 "the best treatment for severe burns in the first instance is to use what is near to hand, for the air must be excluded from a burn as quickly as possible" can result in dangerous complications (10).

On the other hand, efficient and appropriate first aid administered within three hours of the injurious event can reduce burn severity, improve the clinical outcome, and reduce pain, long-term morbidity, cost, and burn-related physical impairments (11). Therefore, appropriate burns first aid health education based on simple, reliable, and evidence-based information is crucial in the early management of burns (12).

Principle of burn first aid management:

The steps for burn first aid intervention are as follows:

- First, remove contaminated footwear, jewelry, and clothing, if not stuck to the skin to remove the source of the burn.
- For chemical burns to the skin, unlike in scald burns, the water does not have to be cold, early application of tap water for at least 20 min, rinsing the burned skin with water could dilute, and remove the agent from the skin and return the skin to normal pH, and thus reduce the length of stay and scarring (10). The process of cooling is linked to decreased mortality rates, alleviation of pain, and reduced cellular damage, leading to enhanced wound healing (13).
- Accidental chemical burns can occur in industrial settings, depending on the specific chemical agents involved. Following initial rinsing with tap water, various substances such as neutralizing agents, antidotes, and specific dressings have been applied, but these are not suitable for non-hospital first-aid treatment.
- As first aid in skin burns, the application of topical creams has not been recommended as these agents might change the color and physical appearance of the burn wound, thus

*Corresponding Author: Golnaz Afzal; Department of Clinical Pharmacy, School of Pharmacy, Shahid Sadoughi University of Medical Sciences, Yazd, Iran. Email: dr.golnaz.afzal@gmail.com, Tel: +983538203419, ORCID: <https://orcid.org/0000-0001-7147-6426>.

influencing the assessment of the depth of the burn (14).

- Covering the burn area with a sterile, non-adhesive dressing has been recommended (15).

In summary, providing basic first aid right after a burn can significantly reduce the risk of complications. Therefore, it's crucial to make evidence-based education on this topic widely accessible in the community, allowing burn victims to effectively address their issues by applying these measures before seeking hospital care.

1. Declarations

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1.4. Conflict of interest

The authors declare no conflict of interest.

1.5. Using Artificial Intelligence Chatbots

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References

1. Żwieręto W, Piorun K, Skórka-Majewicz M, Maruszewska A, Antoniewski J, Gutowska I. Burns: Classification, Pathophysiology, and Treatment: A Review. *Int J Mol Sci*. 2023 Feb 13;24(4):3749.
2. Mlcak RP, Buffalo MC, Jimenez CJ. Prehospital management, transportation, and emergency care. Fifth Ed, Elsevier Inc;2018.
3. Al Dhafiri M, Kaliyadan F, Alghadeer MA, AL-Jaziri ZY, Al-abdulmuhsin ZA, Alaithan ZA. Knowledge, Attitudes, and Practices toward First Aid Management of Skin Burns in Saudi Arabia. *Clin. Pract*. 2022;12(1):97-105.
4. Bennett CV, Maguire S, Nuttall D, Lindberg DM, Moulton S, Bajaj L, et al. First aid for children's burns in the US and UK: An urgent call to establish and promote international standards. *Burns*. 2019;45(2):440-9.
5. Tolouei M, Pirooz A, Ashoobi MT, Davoudpour R, Zarei R, Sadeghi M, et al. Knowledge, attitude, and sources of information towards burn first aid among people referred to a burn centre in the north of Iran. *Int. Wound J*. 2024;21(1):e14334.
6. Alomar M, Rouqi FA, Eldali A. Knowledge, attitude, and belief regarding burn first aid among caregivers attending pediatric emergency medicine departments. *Burns*. 2016;42(4):938-43.
7. Cuttle L, Pearn J, McMillan JR, Kimble RM. A review of first aid treatments for burn injuries. *Burns*. 2009;35(6):768-75.
8. Papachristodoulou V, Tripsianis G, Constantinidis TC, Kakagia DD. Knowledge and Attitudes in First Aid Practices for Thermal Burns: a Cross-sectional Study Among Adults in Northern Greece. *Mater Sociomed*. 2023;35(3):228-33.
9. Burgess JD, Cameron CM, Cuttle L, Tyack Z, Kimble RM. Inaccurate, inadequate and inconsistent: A content analysis of burn first aid information online. *Burns*. 2016;42(8):1671-7.
10. Joo HS, Kim HB. An Etiology Report for Burns Caused by Korean Folk Remedies. *Arch Plast Surg*. 2023;50(3):305-10.
11. Nurmatov UB, Mullen S, Quinn-Scoggins H, Mann M, Kemp A. The effectiveness and cost-effectiveness of first aid interventions for burns given to caregivers of children: A systematic review. *Burns*. 2018;44(3):512-23.
12. D'cunha A, Rebekah G, Mathai J, Jehangir S. Understanding burn injuries in children—A step toward prevention and prompt first aid. *Burns*. 2022;48(4):762-6.
13. Bennett CV, Maguire S, Nuttall D, Lindberg DM, Moulton S, Bajaj L, et al. First aid for children's burns in the US and UK: An urgent call to establish and promote international standards. *Burns*. 2019;45(2):440-9.
14. Das KK, Olga L, Peck M, Morselli PG, Salek AJM. Management of acid burns: Experience from Bangladesh. *Burns*. 2015;41(3):484-92.
15. Chai H, Chaudhari N, Kornhaber R, Cuttle L, Fear M, Wood F, et al. Chemical burn to the skin: A systematic review of first aid impacts on clinical outcomes. *Burns*. 2022;48(7):1527-43.