

## CASE REPORT

## Role of Burn Aid App for Effective Acute Burn Management

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## ABSTRACT

Effective initial management of burn injuries is essential for minimizing tissue damage, reducing pain, and improving long-term outcomes. The increasing integration of mobile technology in healthcare has led to the development of innovative digital tools designed to support emergency care. A Burnaid mobile application is a specialized tool aimed at assisting first responders, healthcare professionals, and laypersons in the early assessment and treatment of burns. This app provides real-time, evidence-based guidance on burn first aid, including cooling protocols, burn size estimation, severity classification, and referral criteria aligned with clinical guidelines. Its features also support education, documentation, and communication between prehospital providers and receiving facilities. Preliminary studies and user feedback suggest that the app improves adherence to burn first aid standards and enhances triage accuracy, particularly in resource-limited or remote settings. This article explores the clinical utility, educational role, and integration of the Burnaid mobile app within existing burn care frameworks and discusses future directions for its development and implementation in global digital health strategies.

## KEYWORDS

- Burnaid app • Burns management • Digital health • Mobile health
- Burn triage • Telemedicine

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## INTRODUCTION

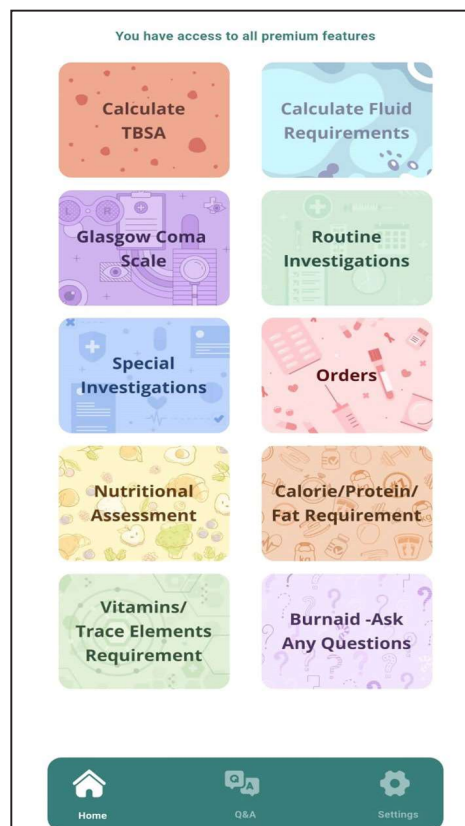
Burn injuries remain a significant global health concern, with effective first aid recognized as a key factor in reducing morbidity and improving patient outcomes. The critical window immediately following a burn injury demands timely, accurate assessment and intervention often in prehospital or resource limited settings. With the rapid advancement of mobile technology in healthcare, digital tools are increasingly being adopted to support clinical decision-making and emergency response. Burnaid, a mobile application has been developed to assist a wide range of users including first responders, healthcare professionals, and persons in primary healthcare in the initial management of burn injuries.

The app provides evidence-based guidance on burn first aid, burn area and depth estimation, referral pathways, and triage decisions. It also supports user education and facilitates communication with burn centers where applicable. By improving adherence to burn management protocols and enhancing the consistency of care, the Burnaid app serves as a practical adjunct to traditional training and resources. This article reviews the app's functionality, clinical relevance, and integration into current burn management practices, while also highlighting opportunities for future development and broader implementation within digital health ecosystems.

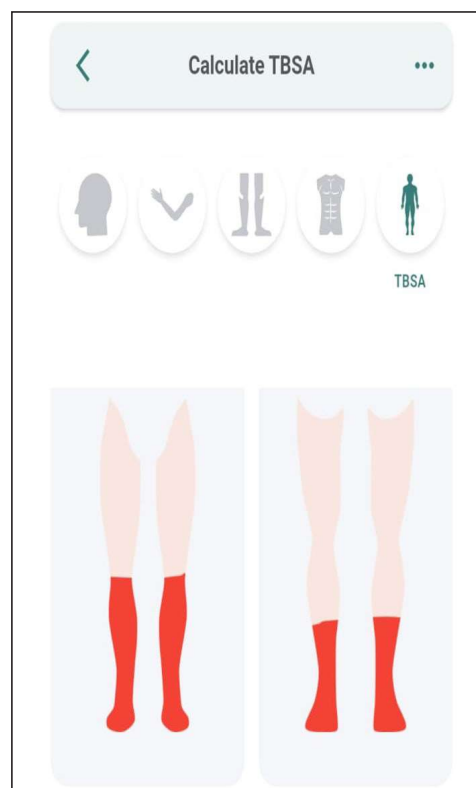
## MATERIALS AND METHODS

This observational study was conducted in the Department of Plastic Surgery at a tertiary care centre, following ethical clearance from the institutional review board and after obtaining informed consent from the patient's guardian.

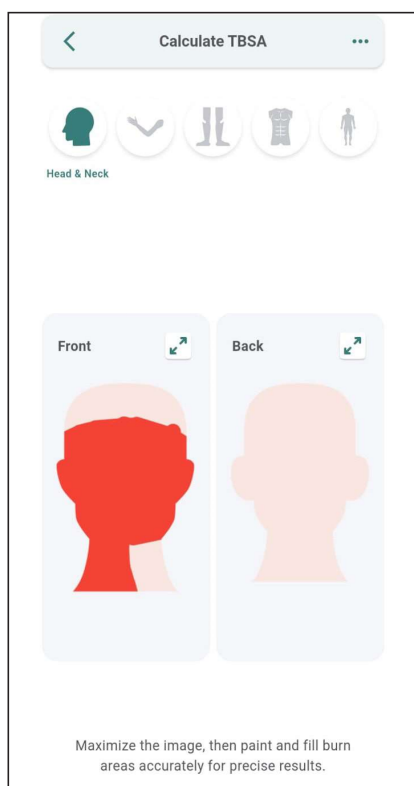
The Burnaid mobile application, available for free on the Google Play Store, was downloaded onto the treating resident doctor's smartphone (*Figure 1*). The app was evaluated during the management of an 11-year-old male patient who presented with mixed-depth burns involving 15% of total body surface area (TBSA). The burns affected the face, anterior neck, and both lower limbs. The TBSA was calculated by shading the affected areas on images of body parts as shown below (*Figure 2 and 3*). The result was produced instantaneously which could be downloaded in pdf or jpeg format.



**Figure 1:** Burnaid app features

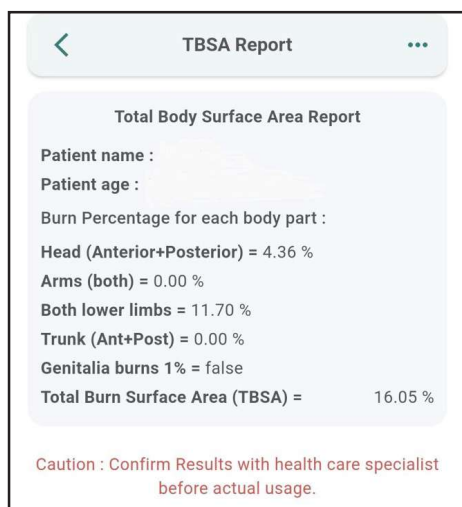


**Figure 2:** 2<sup>nd</sup> degree burns to bilateral lower limbs shaded on the app module

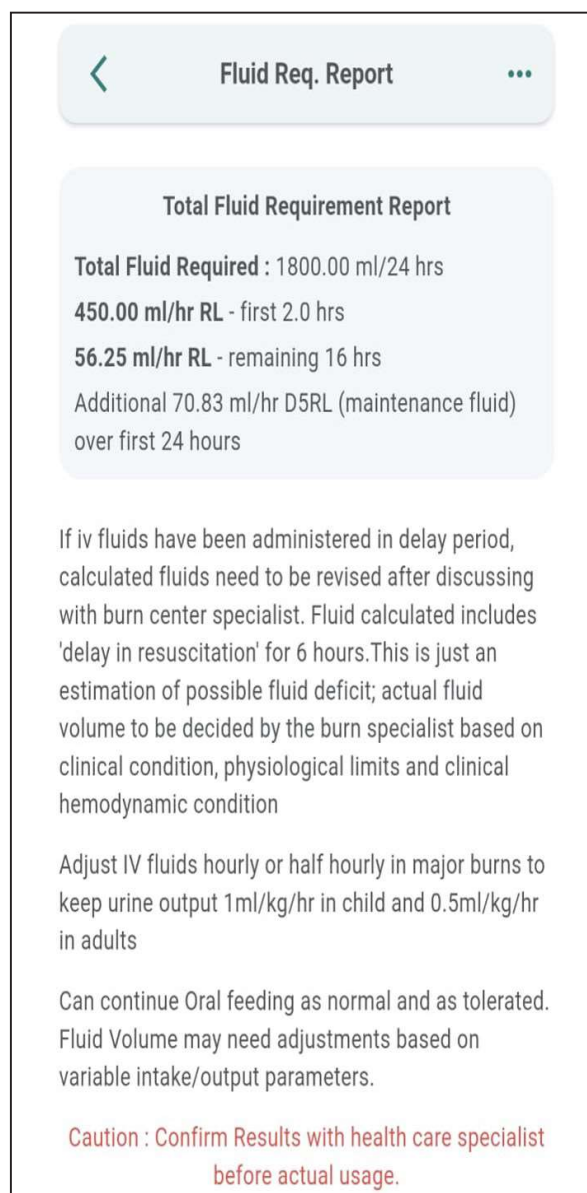


**Figure 3:** 2<sup>nd</sup> degree burns to face and anterior neck shaded on the app module

The TBSA was assessed using both the Burnaid app and conventional clinical methods to compare accuracy and usability. Initial treatment included intravenous fluid resuscitation, (figure 4 and 5) calculated according to fluid management guidelines provided within the app. Further investigations and nutritional management were also planned based on the app's protocols and recommendations.



**Figure 4:** TBSA calculation based on shaded areas



**Figure 5:** Intravenous fluid requirement calculated

To evaluate the effectiveness and clinical utility of the application, qualitative feedback was obtained from the treating resident, focusing on its ease of use, accuracy, and role in guiding burn assessment and overall patient management.

## RESULTS

After following the guidance provided by the BurnAid app, the patient's condition improved over the course of several days. The burn area was carefully monitored for infection, and the pain was well managed with the recommended medication. The patient experienced mild swelling but no signs of infection, and the

healing process was within expected timelines for a second-degree burn.

At a follow-up visit one week later, the patient reported that the burn area was beginning to heal, with no signs of complications. The patient adhered to the app's recommendations regarding wound care, and the healing process was uneventful.

## DISCUSSION

This case demonstrates the potential of the **BurnAid app** in providing effective first-aid and ongoing burn management guidance in rural settings where specialized burn care may not be immediately accessible. The app was instrumental in helping the local healthcare worker assess the severity of the burn, calculate the required fluid resuscitation, and provide clear instructions for pain management and wound care.

### Key Features of the BurnAid App

1. **Burn Classification and Severity Assessment:** The BurnAid app offers a user-friendly interface for both laypersons and healthcare professionals to quickly assess the severity of a burn injury. The app allows users to classify burns into first, second, or third-degree categories, based on depth, appearance, and associated symptoms. This classification helps users determine the appropriate course of action whether it involves simple first aid measures or urgent medical intervention.
2. **First Aid Guidance:** BurnAid provides step-by-step instructions on how to manage burns in the critical moments following injury. For example, the app emphasizes the importance of cooling the burn with running water (not ice), covering the burn with a clean, sterile dressing, and keeping the patient calm. By guiding users through the correct first-aid steps, the app reduces the risk of further injury and minimizes complications, such as infection or increased tissue damage.
3. **Pain Management Recommendations:** Severe pain is a common symptom associated with burns, especially in the early stages. Pain management was also guided by the app, which suggested appropriate dosages of pain-relief medication based on the patient's age and weight.<sup>3</sup> The BurnAid app helps guide

both patients and caregivers on how to manage pain, including the use of over-the-counter pain relief options such as ibuprofen or acetaminophen. The app also offers guidance on when to seek professional medical care for more severe pain or when the burns cover extensive body areas.

Fluid Resuscitation and Total Body Surface Area (TBSA) Calculation  
Fluid resuscitation is essential in managing moderate to severe burns, particularly for patients with significant TBSA involvement. The BurnAid app can help healthcare providers calculate TBSA using the "Rule of Nines" or the Lund-Browder chart and the patient's weight.<sup>1</sup>

1. This function is especially useful in emergency situations where rapid assessment and fluid management are crucial for patient survival.
2. **Referral to Medical Centers and Burn Units**  
One of the app's key features is its ability to identify and provide information on the nearest burn treatment centers and hospitals equipped with specialized care for burn injuries. In cases of severe burns or complications, this feature allows users to quickly refer patients to facilities capable of providing advanced care, including surgery, burn wound management, and long-term rehabilitation.

### Role in Preventing Burn Complications

The BurnAid app not only focuses on initial treatment but also contributes to the prevention of complications, such as infections, scarring, and systemic responses like sepsis. By ensuring that patients receive timely interventions, including proper wound care, infection prevention protocols, and early referral to specialized units, the app helps improve burn outcomes.

1. **Infection Prevention:** The app provides guidance on cleaning and dressing burns appropriately, which helps reduce the risk of infection. In addition, the app offers advice on recognizing signs of infection, such as increased redness, swelling, and pus, which may require immediate medical attention.
2. **Long-Term Burn Management:** BurnAid also educates users on the signs of complications like hypertrophic scarring, contractures, and psychological distress.

Early recognition of these complications allows for timely intervention, including physical therapy, psychological counseling, or surgical revision to improve the long-term quality of life for burn survivors.

### **Impact on Patient and Healthcare Provider Efficiency**

The BurnAid app has the potential to enhance both patient care and healthcare provider efficiency in the following ways:

1. **Improved Decision-Making:** With its evidence-based guidelines and decision-making tools, the app allows healthcare providers to make informed decisions quickly, especially in critical or emergency settings where time is of the essence.
2. **Increased Access to Burn Care Knowledge:** For areas with limited access to healthcare professionals, the app bridges the knowledge gap by empowering laypersons, first responders, and healthcare workers with essential burn management information. This can significantly improve patient outcomes in regions where professional burn care may be scarce.
3. **Cost-Effective:** By providing free access to burn care guidelines and support, the BurnAid app offers a cost-effective solution for individuals and organizations looking to enhance their capacity to manage burn injuries without requiring expensive training or resources.

### **CONCLUSION**

The use of the BurnAid app in this case highlights its significant role in improving the management of burn injuries, particularly in rural settings where immediate access to healthcare professionals may be limited. By offering real-time, evidence-based guidance on burn classification, first aid, and fluid resuscitation, the app enhances the ability of healthcare workers and persons in primary healthcare to provide timely and effective care. Yet, the following limitations noted were previous data could not be saved in the app hence following up of wounds and the risk of infection was found to be a challenge. The features could not be used for burns with delayed presentation. This case demonstrates that mobile health applications like BurnAid can be a valuable auxiliary resource in improving burn care outcomes and ensuring that patients receive appropriate treatment in the critical initial hours after a burn injury.

**Conflicts of interest:** NIL

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