

# Profile of Burn Victims Attended By an Emergency Unit

ORIGINAL

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## Abstract

**Objectives:** To identify the sociodemographic and health profile of burn victims, knowing the characteristics of the events and detecting the major analgesics prescribed in the emergency department.

**Methods:** Descriptive, exploratory and quantitative study with 16 burn victims treated at a Burn Treatment Unit from October 2015 to May 2016.

**Results:** The average age of participants was 31.8 years ( $\pm$  14.1). Mostly, the subjects were male (62.5%), single (43.8%), brown (68.8%), economically active (75.0%) and coming from Aracaju and its surroundings (62.5%). Injuries from burns were mostly of second degree (93.8%) and reached the lower limbs (68.8%). The average burned body surface was 15.8% ( $\pm$  11.5). The circumstances surrounding burns occurred mainly at home (50.0%), on Sundays (25.0%) and in the shifts morning (37.5%) and night (37.5%). The main etiological agent was alcohol (31.3%). All patients received analgesia in the emergency department, but the minority had pain documented (18.8%). The physician was the only professional who reported pain in their records, but did incompletely (18.8%).

**Conclusion:** Due to the negative effects of burns, it is crucial to adopt educational and preventive measures to change the current scenario of epidemiology of such trauma.

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## Keywords

Burns; Epidemiology; Analgesia; Emergency.

## Introduction

Burns are a major public health problem in Brazil and worldwide [1]. They are traumatic skin injuries which result in systemic metabolism of the body [2], in addition to interfering in the functional and psychological aspects of the victims [3-4]. Moreover they are often painful, disabling and distort self-image and social relations [3, 5-6].

It is estimated that in the world, annually, around 265,000 deaths occur and 11 million health services are provided as a result of burns [7]. The World Health Organization (WHO) states that the mortality rate for this type of trauma has declined in recent years, but still remains high, especially in developing countries, which account for approximately 95% of cases of fire burns in the world [1].

In Brazil, the annual estimate is one million people suffering from burns, of which 100,000 seek hospital care, 40,000 require hospitalization and 2,500 die as a result of this type of trauma [8-11]. In the states of northeastern Brazil there is seasonality in the prevalence and incidence of burns, in which the months of June, July and August stand out [9, 11-12].

Often, burn victims live with important consequences and limitations that interfere with social and economic life of the individual, family and State [1, 13]. It is noteworthy that the direct and indirect financial expenses are high [14-15] and disabilities - temporary and permanent - are related to the delay in the return to work and higher rate of morbidity and mortality [15].

One of the main causes of limitations in burns is the pain [6]. It is a common symptom [14,16-18] and results from tissue injury, from the inflammatory process that begins [16-17] and from procedures performed in the treatment [14, 18-22]. When poorly controlled, pain can worsen the overall health status of the patient [6] and negatively interfere with recovery [22]. This reinforces the importance of managing the pain of burn victims since the first service [23]. However, the management of painful

phenomenon is still a challenge for health teams [6, 16].

In this perspective, the WHO considers the development of public policies for the prevention and treatment of burns as a key strategy to reduce morbidity and mortality rates and therefore the overall costs related to this trauma [1]. For this, it is essential the development of epidemiological studies on the profile of burn victims and the circumstances surrounding them. Thus, this study aims to identify the sociodemographic and health profile of burn victims, knowing the characteristics of the events and detecting the major analgesics prescribed in the emergency department.

## Method

This is a descriptive, exploratory study with a quantitative approach and sampling by convenience. The sample consisted of 16 burn victims hospitalized at the Burns Treatment Unit (BTU) of a public hospital in northeastern Brazil from October 2015 to May 2016.

Patients aged over 12 years and with score on the Glasgow Coma Scale equal to 15 were included in the sample. Impaired verbal communication, cognitive or hearing impairment and use of central nervous system depressants were considered exclusion criteria.

Data were obtained from medical records and interviews with participants after prior authorization through the Informed Consent Form. The results were presented in tables and analyzed by means of simple and relative frequencies.

The study met the criteria set forth in Resolution 466/2012 [24] and was approved by the Research Ethics Committee of the Federal University of Sergipe under the CAAE No. 44587415.4.0000.5546.

## Results

The average age of study participants was 31.8 years ( $\pm$  14.1), with highlight for the age group between 12 and 24 years (37.5%). The majority was male (62.5%) and Catholic (62.5%). A considerable part of the subjects declared themselves as unmarried (43.8%) and browns (68.8%). There was average years of schooling of 6.6 full years ( $\pm$  3.8), with predominant schooling equivalent to incomplete primary education (43.8%). Most participants were from Aracaju and its surroundings (62.5%), followed by other municipalities in Sergipe (31.5%). Most of the participants were employed at the time of trauma (75.0%) (**Table 1**).

**Table 1.** Sociodemographic data of burn victims treated at the Burn Treatment Unit. Aracaju, SE, Brazil, 2016.

Variable	n	%
Gender		
Female	6	37.5
Male	10	62.5
Age range		
12 $\leq$ 24 years old	6	37.5
25 $\leq$ 35 years old	5	31.2
$\geq$ 36 years old	5	31.2
Marital status		
Single	7	43.8
Married	2	12.5
Stable union	5	31.2
Divorced	2	12.5
Schooling		
No schooling	2	12.5
Incomplete Primary Education	7	43.8
Complete Primary Education	2	12.5
Incomplete High School	3	18.8
Complete High School	1	6.2
Incomplete Higher Education	1	6.2
Skin color		
White	1	6.3
Black	4	25.0
Brown	11	68.8

Variable	n	%
Origin		
Aracaju and its surroundings*	10	62.5
Another municipality of SE	5	31.3
Other state	1	6.3
Paid activity		
Yes	12	75.0
No	4	25.0
*: Aracaju and its surroundings comprises the capital city and neighboring cities: Barra dos Coqueiros, Nossa Senhora do Socorro and Sao Cristovao.		

Almost all of the subjects had second-degree burns (93.8%). Only one participant suffered only third-degree lesions (6.3%), and only one was recorded in the medical records as having varying degrees of burns - first and second (6.3%). The average of the burned body surface was 15.8% ( $\pm$  11.5). Burns affected mainly the lower limbs (68.8%), trunk (56.3%) and upper limbs (50.0%). It is worth noting that often the injuries affected more than one body segment simultaneously. Most of the participants denied any previous pathology (81.2%) (**Table 2**).

**Table 2.** Health features and care provided to burn victims treated at the Burn Treatment Unit. Aracaju, SE, Brazil, 2016.

Domains/Facets	Average	Median
Health Features		
Depth of the injury		
1st degree	1	6.3
2nd degree	15	93.8
3rd degree	1	6.3
Body segments affected by burns		
Head and neck	7	43.8
Trunk	9	56.3
Upper Limbs	8	50.0
Lower Limbs	11	68.8
Genitalia	1	6.3
Body segments affected by burns		
No	13	81.3
Yes	3	18.7
Diabetes Mellitus	1	6.3

Health Features		
Body segments affected by burns		
Arterial hypertension	1	6.3
Smoking	1	6.3
Alcohol abuse	1	6.3
Depression	1	6.3
Not applicable	13	81.3
Care To The Victim In The Emergency Unit		
Prescription of analgesia		
No	0	0.0
Yes	16	100.0
Painkillers prescribed		
Dipyrone	15	93.8
Tramadol	9	56.3
Morphine	3	18.7
Ketoprofen	2	12.5
Recording of pain in medical records		
No	13	81.3
Yes	3	18.8

Most burns happened accidentally (93.8%), but there was an attack (6.3%), and the home environment was the main scenario of events (50.0%), followed by public road (25.0%). Sunday (25.0%), Tuesday (18.8%) and Friday (18.8%) were the days of the week that stood out in relation to traumatic events with burns, as well as morning (37.5%) and evening shifts (37.5%) (**Table 3**).

Alcohol was the main etiological agent (31.2%) of burns, followed by open flame (18.8%). Few subjects (12.5%) reported being drunk at the time of the accident (**Table 3**).

Regarding the admission of patients in the emergency department, medical records informed that all received some kind of analgesia at that time. Dipyrone was the most prescribed analgesic (93.8%), followed by Tramadol (56.3%) (**Table 2**). Often more than one medication was prescribed simultaneously. The time for the first analgesia in the emergency room showed an average of 103.1 minutes, with a maximum of 420 minutes and minimum of 10 minutes.

**Table 3.** Features of burn events in victims treated at the Burn Treatment Unit. Aracaju, SE, Brazil, 2016.

Variable	n	%
Nature of injury		
Accidental	15	93.8
Intentional	1	6.3
Event setting		
Home	8	50.0
Public road	4	25.0
Trade/Service	2	12.5
Industry/Construction	1	6.3
Others	1	6.3
Day of the week		
Sunday	4	25.0
Monday	1	6.3
Tuesday	3	18.8
Wednesday	2	12.5
Thursday	2	12.5
Friday	3	18.8
Saturday	1	6.3
Event shift		
Night (1 am to 5:59 am)	1	6.3
Morning (6 am to 12:59 am)	6	37.5
Afternoon (1 pm to 6:59 pm)	3	18.8
Evening (7 pm to 11:59 pm)	6	37.5
Etiological agent		
Alcohol	5	31.3
Open flame	3	18.8
Hot water	2	12.5
Hot oil	2	12.5
Hot object	2	12.5
Gasoline	1	6.3
Steam	1	6.3
Use of alcohol		
No	14	87.5
Yes	2	12.5

It is noted that although all of the participants received analgesia in the emergency department, a minority (18.8%) had pain documented in the medical records (**Table 2**). All recordings were performed by physicians (18.8%), who only documented the presence or absence of pain (18.8%).

## Discussion

Knowing the profile of burn victims and the circumstances of accidents is essential for the planning and development of public policies and individual campaigns or guidelines aimed at preventing this type of trauma. In addition, it allows professionals and health managers to optimize the care provided, since, based on the evidence, they can better define treatment protocols. Also, the dissemination of drugs used to relieve pain in the emergency department encourages discussion of new evidence.

The predominance of males found in this study is in line with national [9, 11, 25-31] and international publications [13, 32-35]. By socially established gender differences and some personality characteristics, men are more exposed to risks both in personal and in professional life, which may explain their prevalence in this research.

In addition, men have taken proportionately greater association with sequels and disabilities [13], which, regardless of being temporary or permanent, have the power to reduce the economic and social productive potential [13, 27]. This is aggravated by the higher incidence of burns among young and economically active adults [25, 27, 32], which consequently increases the public and private, direct and indirect expenditure arising from this trauma.

From the perspective of prevention, it is important to understand the main etiological agents of burns. As demonstrated in this study, flammable liquids, such as alcohol, lead this ranking [11, 25-26, 30-31, 36] and are associated with high morbidity and mortality rates, high costs and irreversible sequels. [37] Other studies consider the open flame

as the main causative agent [9, 27, 29, 32]. Hot liquids stood out when considering the children [11, 27]. The indiscriminate use of flammable substances causes a greater number of traumas from burns; therefore, it is required compliance with the relevant legislation.

Alcohol may be involved in accidental or intentional burns. In this study, most of the burns were accidental, as in other studies [25, 34], and occurred mostly at home [25, 27, 32, 24, 38]. A considerable part of traumas and accidents occur in the home, an environment in which the individual feels safe and free of hazards, so they unconsciously adopt behaviors sometimes considered careless or negligent.

There was no significant distinction between days of the week for the occurrence of burns, although Sunday has predominated. Study based on a national survey conducted by the Brazilian Ministry of Health found that the burns prevail on weekends (Friday, Saturday and Sunday) and during afternoon and evening [27]. This differs in part from that found in this study, which highlights the occurrence of burns during morning and evening.

Only a minority of subjects surveyed reported being under the influence of alcohol at the time of the accident, as found in a national study, which also states that the percentage of drunk men was twice higher when compared to women [27]. However, it is known that alcohol consumption increases during the weekends [39] and is associated with increased incidence and severity of trauma due to energy transfer, failure to escape and impaired recovery [40]. Nevertheless, socialize on weekends is part of Brazilian culture, which often involves the consumption of alcoholic beverages and the adoption of risk behaviors.

The average burned body surface corresponds to the average burned patient and coincides with other studies [11, 29]. There are also those which found the little burned as the most frequent [28, 30] The extent of the injuries and trauma severity have

a directly proportional relationship [9, 41]. In this sense, research conducted in Chile found 43% of burned surface as the lethal dose 50 [32]. Burns are systemic traumas that, when extensive, are capable of interfering with the hemodynamic and immunity status of the patient, and they demand more invasive procedures and therefore increase the risk of infection.

It was found that the major burn injury sites are the lower limbs, followed by the trunk and upper limbs. There is no consensus in this regard, but ends stand out [27, 38, 31, 33-35]. The circumferential burns of thorax and extremities may compromise the life and/or viability of the affected limb [42]. When affecting hands and feet, burns are considered important and troubling, since there is considerable likelihood of sequels that compromise the economic and social productivity of the victim.

In line with other studies, there was a higher occurrence of second-degree injuries [9, 25, 30, 33, 35-36]. Deeper lesions are associated with a higher mortality rate [9], while the most superficial have more relationship with pain. However, it is known that all burned patients experience pain in greater or lesser intensity [14].

Regardless of the type of burn and the pain intensity, all patients received analgesia in the emergency department. Dipyron (simple painkiller) and Tramadol (weak opioid) predominated. Singer (2015), in his study, says that in the emergency unit, patients report moderate pain equal to five (moderate), and, when considered only the superficial burns, there was increased average for six. There was no association between lesion size and the intensity of pain [35]. In this study it was not possible to obtain this information on the pain in the emergency department.

Pain treatment should be based on the analgesic ladder suggested by WHO, according to which moderate pain should be treated with simple painkillers associated with weak opioids, while for severe pain strong opioids are absolutely necessary. Adjuvant

treatment is also indicated by the ladder in all steps [43-45]. Success in the treatment of pain is essential for the recovery of victims in the biopsychosocial and spiritual aspects.

The first step for proper treatment of the painful phenomenon is to believe in the patient [46] and institute effective treatment plan. Pain should be evaluated in a systematic and regular manner, and documented [17, 12]. For this purpose, it is important to use validated and standardized instruments [18, 47]. However, a minority of patients had pain documented in the medical record and besides that, the few reports were incomplete. In this sense, although all subjects have received analgesia, there is no guarantee that had their pain was properly treated.

This study was limited by the small sample size. Moreover, it was not possible to collect data on the pain in the emergency department, as the survey was conducted in the Burn Treatment Unit and there were no medical records about this aspect of the study object.

## Conclusion

Since burns are a type of trauma that affects mainly the ends of economically active men, it can be inferred that, besides the physical sequels and financial damage, burns disturb the psychological state of its victims and their families, and negatively influence the quality of life of individuals in the short, medium and long term.

Alcohol stands out as an important etiologic agent in the scenario of burns, which occur mainly at home on Sundays and in the morning and evening. In this perspective, it is crucial to alert the community about the risks they are exposed to when they cook, work, play or perform other activities of daily living. In addition to the educational, preventive and legal measures, there is also needed of effective public policies to achieve changes in the current scenario of the epidemiology of burns.

Based on scientific evidence and epidemiology of burn injuries, authors suggest the development of care protocols aimed at optimizing care provided in emergency units, including those related to pain management because, despite the prescribed analgesia, due to lack of record, it is believed that the treatment was based on empiricism and not on the actual need of the patient.

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