



# Burns unit at the Hospital de Clínicas of the Universidade Federal de Uberlândia, Brazil: an epidemiological study

## *Unidade de queimados do Hospital de Clínicas da Universidade Federal de Uberlândia, Brasil: estudo epidemiológico*

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### ■ ABSTRACT

**Introduction:** Burns, a public health problem, are injuries that can occur on the skin or other tissues of the body resulting from the trauma of thermal origin, which can cause mild, severe injuries and even death. Thus, the epidemiological characteristics of patients seen at the Burn unit of the Hospital de Clínicas of the Universidade Federal de Uberlândia are studied. **Methods:** Cross-sectional study of the data recorded in patients' medical records treated for the burn at the Burn Units from 2016 to 2019. **Results:** 252 medical records were reviewed, with the male gender of the adult group being most affected. The main causal agent was the flammable liquid (42.4%) with a predominance of alcohol (66.35), occurring at home (59.9%). The average percentage of burned body surface was 17.7%, requiring a graft or surgical debridement in 25% of the patients. The average hospital stay was 23.3 days, requiring 8.7% of the Intensive Care Unit. The attempt at self-extirpation was 5.5%, with a general death rate of 3.5%. **Conclusions:** Burn patients treated at the Burn Unit of the Hospital de Clínicas of the Universidade Federal de Uberlândia encompasses more of the young and adult population, with alcohol being the predominant cause, with an average death rate like other regions. This study will help create measures in search of reducing the number of cases and adapting the care quantitatively and qualitatively, contributing to the elaboration of care protocols to ensure the quality of the care of the patients and the population.

**Keywords:** Burns; Burn units; Epidemiology; Public health; Quality of life.

### ■ RESUMO

**Introdução:** As queimaduras, um problema de saúde pública, são lesões que podem ocorrer na pele ou outros tecidos do corpo decorrentes de trauma de origem térmica, podendo ocasionar lesões leves, graves e até mesmo o óbito. Assim, são estudadas as características epidemiológicas dos pacientes atendidos na Unidade de Queimados do Hospital de Clínicas da Universidade Federal de Uberlândia. **Métodos:** Estudo transversal de dados registrados nos prontuários dos pacientes atendidos por queimadura na Unidade de Queimados de 2016 até 2019. **Resultados:** Um total de 252 prontuários foram revisados, sendo mais atingido o gênero masculino da faixa etária adulta. O principal agente causal foi o líquido inflamável (42,4%), com predomínio do álcool (66,35), acontecendo no domicílio (59,9%). O percentual médio da superfície corporal queimada foi de 17,7%, precisando de enxerto ou debridamento cirúrgico 25% dos pacientes. A média de internação foi 23,3 dias, com 8,7% necessitando de Unidade de Terapia Intensiva. A tentativa de autoextermínio foi de 5,5%, sendo a taxa geral de óbito de 3,5%. **Conclusões:** Pacientes por queimadura atendidos na Unidade de Queimados do Hospital de Clínicas da Universidade Federal de Uberlândia abrangem mais a população jovem e adulta, sendo o álcool a causa predominante, com média de óbitos similar a outras regiões. Este estudo ajudará a criar medidas no sentido de reduzir o número de casos e adequar o atendimento de forma quantitativa e qualitativa, contribuindo para a elaboração de protocolos de cuidados, a fim de assegurar a qualidade da assistência dos pacientes e da população em geral.

**Descritores:** Queimaduras; Unidade de queimados; Epidemiologia; Saúde pública; Qualidade de vida.

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## INTRODUCTION

Burns are injuries that can occur to the skin or other tissues of the body resulting from the trauma of thermal origin resulting from exposure or contact with flames, hot liquids, electricity, cold, chemical substances, radiation, or friction, which can lead to local or systemic changes. With partial or total destruction or compromise of adjacent tissues<sup>1,2</sup>. The extent of the damage depends on the temperature of the agent, the heat concentration and the duration of contact, as the body has few protective repair mechanisms specific to each type of burn<sup>3</sup>.

According to the World Health Organization (WHO), burns are a public health problem, being the fourth most common type of trauma, after traffic injuries, falls, and interpersonal violence<sup>2,4</sup>, which can cause mild, severe, and even minor injuries. the death.

Current global data on the number of people seeking specialized care for this type of injury are not available. However, in 2004 almost 11 million people suffered burns severe enough to require medical attention<sup>2</sup>. Data from the American Burn Association (ABA) show that more than 450,000 people are treated annually in the United States and Canada, and in 2014, 3,275 deaths were recorded<sup>5</sup>.

According to the Brazilian Ministry of Health, in 2017, there were around 1,000,000 visits, of which 100,000 sought hospital care, and about 2,500 died directly or indirectly<sup>6</sup>. It is estimated that approximately 180,000 deaths occur every year in the world, the vast majority taking place in low- and middle-income countries<sup>2</sup>, where up to 90% of burns occur<sup>4</sup>. In fact, in many high-income countries, burn mortality rates have been decreasing.

## OBJECTIVE

To study the epidemiological characteristics of patients treated at the burn unit (BU) of the Hospital de Clínicas of the Universidade Federal de Uberlândia (HC-UFU), located in the city of Uberlândia, in the Southeast region of Brazil, the second largest municipality in the state of Minas Gerais, with a high Human Development Index (HDI 2010) (0.789), which is the referral center for burn patients in this region and follows the hospitalization criteria standardized by the Brazilian Medical Association (AMB) and the Federal Council of Medicine (CFM)<sup>1</sup>.

## METHODS

A cross-sectional study of hospitalized patients and HC-UFU BU discharge data from Jan 1, 2016, to

Dec 31, 2019. Patients treated or hospitalized in other services for some burn were excluded.

The analysis was performed on the data recorded in electronic and physical medical records employing frequency distribution and percentages from their tabulation and graphic representation in SPSS version 26.0.

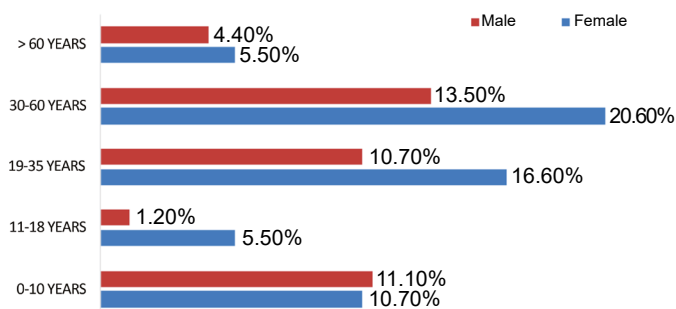
The research was approved by the Research Ethics Committee involving human beings of Plataforma Brasil (opinion No. 4,351,266).

## RESULTS

### Distribution by age group, gender, and race

A total of 252 medical records were reviewed, corresponding to 59.1% of males and 40.8% of females, with a ratio of 1.4:1. 21.8% were children between 0 and 10 years old, 6.7% were adolescents between 11 and 18 years old, 27.3% were young people between 19 and 35 years old, 34.1% were adults between 36 and 60 years old, and 9.9% were elderly over 60 years old (Figure 1).

From the distribution by race, 48.4% were brown, 43.2% white, 7.9% black and another 0.4%.



**Figure 1.** Age group and gender of patients at the Burns Unit of the Hospital de Clínicas of the Universidade Federal de Uberlândia – 2016 - 2019.

### Cities and burn environment

Patients were from the city of Uberlândia (53.1%), Patrocínio (7.9%), Araguari (7.5%), Monte Carmelo (4.7%) and other cities (26.8%).

The environments where the burns occurred were the domicile (59.9%), work (19.8%), public roads (12.6%) and other places (13%) (Figure 2).

### Anatomical areas of burns

Burns were categorized into four distinct anatomical areas. Upper extremities (29.6%), trunk (including buttocks and genitalia) (29.1%), lower limbs (20.9%) and head, face and neck (20.2%).

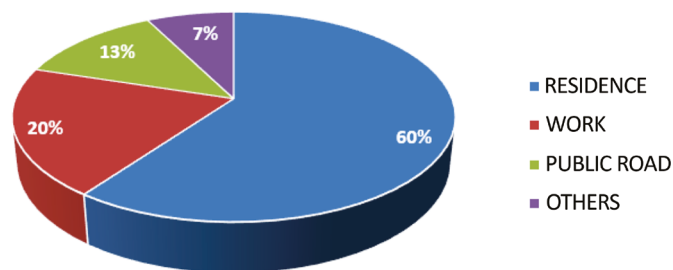


Figure 2. Environment where burns occurred in patients at the Burns Unit of the Hospital de Clínicas of the Universidade Federal de Uberlândia – 2016 - 2019.

### Extent of burned body surface (BBS) and degree of burns

The extent of the burn was classified as small, medium, and large, obtaining 51.1%, 32.5% and 16.2%, respectively, with an average percentage of 17.7%.

In children, small burns had SCQ below 10%, medium burns between 11-24% and large burns above 25%, with 47.2%, 38.1% and 14.5%, respectively. For adolescents, young people, and adults, 41.1%, 60.8% and 50% were considered as having minor burns (SCQ below 15%); average burn (SCQ 16-29%) 41.1%, 23.1% and 34.8%, respectively; and large burn (SCQ above 30%) 17.6%, 15.9%, 15.1%, respectively. Using the same extension categorization for the elderly, 44% were minor, 32% were medium, and 24% were major burns (Figure 3).

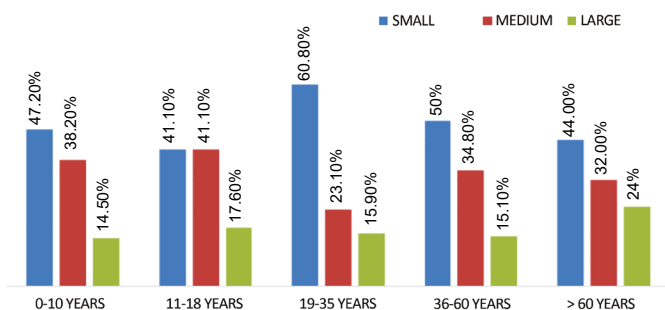


Figure 3. Extent of burns by age group of patients at the Burns Unit of the Hospital de Clínicas of the Universidade Federal de Uberlândia – 2016 - 2019.

The general distribution by the degree of burns was 81.7% for the 2nd degree and 18.3% for the 3rd degree. In children, adolescents, young people and adults, this distribution was: 90.9%, 88.2%, 85.5% and 80.2% for the 2nd degree, respectively, and in the elderly, 52% for the 2nd degree and 48% for the 3rd degree.

### Etiology of burns by age group

The main causes were flammable liquids, with 42.4%, scalding, 26.9%, direct flame, 16.2%, electric

burn, 7.5%. Of the flammable liquids, alcohol was the agent in 66.35%, followed by gasoline, 12.1%.

In children, burns from scalding occurred in 74.5% and from flammable liquids in 14.5% (75% from alcohol). In adolescents, burns caused by flammable liquids occurred in 58.8% (60% by alcohol) and scalding in 23.5%. In young people, trauma by flammable liquids occurred in 52.1% (69.4% by alcohol) and direct flame in 17.3%. In adults, burns from flammable liquids occurred in 48.8% (76.1% by alcohol) and direct flame in 18.6%. Among elderly patients, we found direct flame in 36% and flammable liquids in 28% (42.8% for alcohol and oil) (Figure 4).

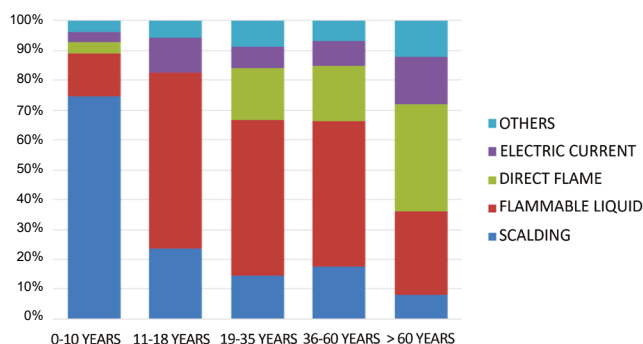


Figure 4. Etiological agent of burns by age group of patients at the Burns Unit of the Hospital de Clínicas of the Universidade Federal de Uberlândia – 2016 - 2019.

### Surgical treatment

Grafting was performed in 25% of the patients, electrical causes in 47.3%, direct flame in 43.9%, flammable liquids in 25.2% and scalding in 11.7%; 24.2% also required surgical debridement, 47.3% by electric current, 43.9% by direct flame, 26.1% by flammable liquids and 8.8% by scalding (Figure 5). Required other surgical procedures 5.4%.

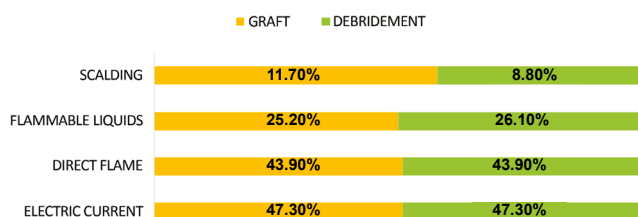


Figure 5. Grafting and debridement by an etiologic agent of burns in patients at the Burns Unit of the Hospital de Clínicas of the Universidade Federal de Uberlândia – 2016 - 2019.

### Hospitalization, intentionality of injury and death

The mean length of stay at the BU was 23.3 days, and 8.7% needed to stay in the Intensive Care Unit (ICU), with a mean time of 19.4 days. Intentional injuries

(by other people) occurred in 7.1%, and attempted self-extirpation was 5.5%. The overall death rate was 3.5%.

## DISCUSSION

Burns is one of the most severe types of traumas, and their causes and associated factors differ between countries and regions, where hospital or BU data can provide useful information for establishing goals and methods in favor of their prevention and care.

This study, as well as others, carried out in UQ<sup>7,8</sup>, shows that burns affect the young and adult population more, with alcohol combustion being the major cause of hospitalization, as alcohol is the agent routinely used in our region as an energy source<sup>3,9</sup>, with hot liquid scalding included in most childhood accidents<sup>2,10</sup> as the most frequent cause of burns in children.

As reported by the WHO<sup>2</sup>, the burns of our patients also occurred mainly in the domestic and work environment, with a predominance of male patients<sup>11,12</sup>, which may be because men more than women perform household maintenance activities, leisure and engaged in risky professions, so they are more likely to be injured at home or at work, which would be the reason why we have more injuries in the upper limbs, similarly to what is reported in the literature<sup>11,13</sup>.

Skin grafting or surgical debridement was necessary for 25% of the patients, being more related to burns caused by electric currents and direct flame, which are the predominantly reported harmful causes<sup>13</sup>.

The percentage of attempted self-extirpation (5.5%) is between the range of publications<sup>11,14</sup> and may have untreated or undiagnosed psychiatric pathologies as causes, with depression as the most frequent cause<sup>15</sup>.

The death rate (3.5%) was like other studies<sup>16</sup>, mainly due to the variables BBS<sup>7</sup> and depth of burns<sup>17</sup>.

Globally, there has been a decrease in severity, mortality, and a trend in the length of hospital stay, especially in countries with high and medium development<sup>18,19</sup>, variables that differ with this research in which the results were higher, despite our region having an HDI high.

## CONCLUSION

Burn patients treated at the UQ of the HC-UFU cover more of the young and adult population, with alcohol combustion being the predominant cause, with an average of deaths similar to other regions. However, the trend toward decreasing severity, mortality and hospital stay in countries with high and medium development differs from our results, despite our region having a high HDI, so further studies are needed.

This study will help create measures to reduce the number of cases and adapt care quantitatively and

qualitatively, contributing to the elaboration of care protocols to ensure the quality of care for patients at the UQ of HCUFU and the general population.

## COLLABORATIONS

**IOGM** Analysis and/or interpretation of data, Statistical analysis, Final approval of the manuscript, Acquisition of funding, Data Collection, Conceptualization, Conception and design of the study, Resource Management, Project Management, Investigation, Methodology, Carrying out the operations and/or experiments, Writing - Preparation of the original, Writing - Review and Editing, Software, Supervision, Validation, Visualization.

**SSC** Analysis and/or interpretation of data, Final approval of the manuscript, Data Collection, Conception and design of the study, Methodology, Writing - Preparation of the original, Writing - Review and Editing, Supervision, Validation, Visualization.

**ARD** Analysis and/or interpretation of data, Statistical analysis, Final approval of the manuscript, Data collection, Research, Methodology, Writing - Preparation of the original, Writing - Review and Editing.

**GATOJ** Analysis and/or interpretation of data, Final approval of the manuscript, Data Collection, Investigation, Carrying out operations and/or experiments, Writing - Preparation of the original, Writing - Review and Editing.

**RMSC** Analysis and/or interpretation of data, Final approval of the manuscript, Data Collection, Research, Writing - Preparation of the original.

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