

# Health education and care in nursing: Planning, management and evaluation of actions to burns

Educação e cuidados em saúde na enfermagem: Planejamento, gerenciamento e avaliação das ações frente às queimaduras  
Educación sanitaria y cuidados en enfermería: Planificación, gestión y evaluación de las acciones contra las quemaduras

## RESUMO

**Objetivo:** Investigar o perfil epidemiológico de casos de queimaduras no estado do Pará entre 2011 e 2021. **Método:** Estudo descritivo, retrospectivo, de abordagem quantitativa, que compreende um período de 10 anos, baseado na coleta de dados secundários a partir de informações em saúde disponíveis na base de dados do DATASUS (Departamento de Informática do Sistema Único de Saúde) do Ministério da Saúde, no Brasil. **Resultados:** Identificou-se um total de 5.938 pessoas internadas por queimaduras no estado do Pará no período estudado, no qual evidencia que indivíduos do gênero masculino em idade adulta e autodeclarados pardos (66,26%) obtiveram mais registros no sistema, em comparação com o sexo feminino (33,73%), sendo a região de saúde Metropolitana I a que mais notificou casos. **Conclusão:** observou-se que as queimaduras são mais frequentes no gênero masculino na fase adulta, devido exercerem atividades profissionais com mais riscos. Outro destaque está nos cuidados no ambiente doméstico, onde o domicílio configurou-se com o maior número de ocorrências por queimaduras, principalmente devido à presença de crianças e de agentes inflamáveis. Nota-se a importância da adoção de estratégias de prevenção de acidentes, identificando as principais causas para posteriormente desenvolver educação em saúde à população.

**DESCRIPTORES:** Queimaduras; Prevenção de Acidentes; Educação em Saúde.

## ABSTRACT

**ABSTRACT:** Objective: To investigate the epidemiological profile of burn cases in the state of Pará between 2011 and 2021. Method: A descriptive, retrospective, quantitative study covering a period of 10 years, based on the collection of secondary data from health information available in the database of DATASUS (Department of Informatics of the Unified Health System) of the Ministry of Health, Brazil. Results: A total of 5,938 people hospitalized for burns in the state of Pará in the studied period were identified, which shows that adult males and self-declared browns (66.26%) had more records in the system, compared to females (33.73%), and the health region Metropolitan I was the one that most notified cases. Conclusion: it was observed that burns are more frequent in the male gender in adulthood, due to professional activities with more risks. Another highlight is the care in the domestic environment, where the home was configured with the highest number of occurrences of burns, mainly due to the presence of children and flammable agents. It is noted the importance of adopting strategies for accident prevention, identifying the main causes to subsequently develop health education for the population.

**DESCRIPTORS:** Burns; Accident Prevention; Health Education.

## RESUMEN

**Objetivo:** Investigar el perfil epidemiológico de los casos de quemaduras en el estado de Pará entre 2011 y 2021. **Método:** Estudio descriptivo, retrospectivo, con enfoque cuantitativo, que comprende un período de 10 años, a partir de la recolección de datos secundarios de la información de salud disponible en la base de datos del DATASUS (Departamento de Informática del Sistema Único de Salud) del Ministerio de Salud, Brasil. **Resultados:** Se identificaron 5.938 personas hospitalizadas por quemaduras en el estado de Pará en el período estudiado, lo que muestra que los hombres adultos y autodeclarados morenos (66,26%) obtuvieron más registros en el sistema, en comparación con las mujeres (33,73%), y la región sanitaria Metropolitana I fue la que más notificó casos. **Conclusión:** se observó que las quemaduras son más frecuentes en el género masculino en la fase adulta, debido a que ejercen actividades profesionales con más riesgos. También destaca la atención en el ámbito doméstico, donde el hogar se configuró con el mayor número de ocurrencias de quemaduras, principalmente por la presencia de niños y agentes inflamables. Se constata la importancia de adoptar estrategias de prevención de accidentes, identificando las principales causas y desarrollando posteriormente la educación sanitaria de la población.

**DESCRIPTORES:** Quemaduras; Prevención de accidentes; Educación Sanitaria.

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ORCID: 0000-0002-6034-1902**INTRODUÇÃO**

**B**urns are an acute and chronic-debilitating condition that can reach deep layers of tissue beyond the skin, such as tendons, muscles and bones. These accidents, in addition to resulting in high mortality rates, when not fatal, cause functional limitations, aesthetic deformities, impairment of psychological well-being, activities of daily living and decreased quality of life.<sup>1</sup> Also noteworthy is the culmination in an image distortion by the re-epithelialization process, which, even after physical survival, a frequent social death can be triggered.<sup>2</sup>

Accidents caused by burns are frequent worldwide and represent a strong impact on the profile of global morbidity and mortality, thus configuring an aggravation of social, economic and public health repercussions.<sup>3,4</sup> This condition is the fourth most common, after traffic accidents, falls and interpersonal violence.<sup>5</sup>

Studies by the World Health Organization (WHO) indicate that mortality rates from burns are higher in low- and middle-income countries as opposed to high-income countries. However, deaths are not the only problem, for every person who dies as a result of burns, so many others

remain alive and with chronic-debilitating sequelae.<sup>6</sup>

In high-income countries, as a result of institutional efforts in favor of prevention and treatment, much has been achieved with regard to reducing the damage of burn injuries. Examples of strategies that have been applied in high-income countries and that should be applied in low- and middle-income countries are: stricter legislation, development in the treatment of burns, promotion of the use of smoke detectors and increased safety in domestic fuel devices, among others.<sup>6</sup>

In Brazil, statistics from the Mortality Information Systems and Hospital Admissions System, SIM (Sistemas de Informação de Mortalidade) and SIH (Sistema de Internações Hospitalares), respectively, reveal that the number of deaths related to burns corresponds to about 1.6% of all deaths from external causes, also show that 12% of total hospital admissions are due to burn injuries, which corresponds to a cost of BRL 191,919,617.53, that is, 13% of the cost of hospital admissions due to external causes.<sup>7</sup>

Currently, the healing process and the pathophysiology of systemic changes caused by burns are already known. This knowledge, as well as technological advan-

ces and innovations in hemodynamic stabilization and cardiopulmonary resuscitation techniques, are essential for reducing deaths from hypovolemic shock and pre-renal failure. However, despite advances in the treatment of burns that minimize morbidities and support a better quality of life, efforts need to be taken to prevent these accidents and implement health care and education.<sup>1</sup>

In the Unified Health System - SUS, actions for the prevention and control of risks and diseases are included in the set of actions planned to be carried out in Primary Care by a multiprofessional team and aimed at the population in a defined territory. Notwithstanding this attribution to the entire health team, it is up to Nursing to plan, manage and evaluate the actions developed by the team, aiming at improving health individually, family and collectively.<sup>8</sup>

In this sense, for actions to be directed to the health needs of the population, and the planning of educational practices in health includes the choice of interventions and efficient approaches to prevent burns to this particular public in which accidents are more prevalent, it is necessary to investigate the epidemiology of the occurrence of cases.

Thus, the present work aims to investigate the epidemiological profile of burn cases in the state of Pará between 2011 and 2021. Activities must follow the logic of planning the work process based on the needs of the territory, prioritizing the population with the highest degree of vulnerability and epidemiological risk.<sup>8</sup>

**METHOD**

This is a descriptive, retrospective, mixed approach study, covering a period of 10 years, from 2011 to 2021, based on secondary data from health information available in the DATASUS database (Department of Informatics of the Unified Health System) of the Ministry of Health. The analyzed data were extracted from the Hospital Information System (SIH/SUS) whose purpose is to record the services financed by the SUS resulting from hospital admissions, as well as the systematic composition of these data.<sup>9</sup>

Burns correspond to chapter XIX of the ICD-10 related to “Injuries, poisoning and certain other consequences of external causes” and are included in code 283 which comprises burns and corrosion - T20 to T32 of the ICD-10. The study integrates the 13 Health Regions of Pará, stipulated in accordance with Resolution CIB/PA N° 90 - of June 12, 2013, divided into: Araguaia, Baixo Amazonas, Carajás, Lago de Tucuruí, Marajó I, Marajó II, Metropolitana I, Metropolitana II, Metropolitana III, Rio Caetés, Tapajós, Tocantins and Xingu. 11 With the period determined from March 2011 to March 2021, excluding information outside the period stipulated by the study.

Information on hospital admissions was identified through the electronic address: <http://www2.datasus.gov.br/DATASUS/index.php>. After that, the following steps were followed: tabnet service > epidemiological and morbidity > SUS hospital morbidity > General, by place of hospitalization - from 2008. To obtain data on “Admissions by Health Region (CIR) by Municipality”, categories were selected within each of the three clas-

ses available in the system.

In relation to class 1 - “Hospital morbidity of the SUS - by place of hospitalization - Pará”, it was defined: row: municipality > column: health region (CIR) > Hospitalization content. Regarding class 2 - “Available periods”, it was defined, from January 2011 to December 2021. In relation to class 3 - “Available selections”, it was defined: Health Region (CIR) - All categories> ICD-10 Chapter - XIX Enven and some out injuries resulting from external causes > ICD Morb List 10 - Burns and corrosion.

In order to obtain age, gender and race, in class 3, the selection of the category Age Group 1- 1 to 9 years, 10 to 19 years, 20 to 59 years, 60 to 80 years and over or Gender: All categories; or Color/race: White, Black, Brown, Yellow and Indigenous.

The raw information was tabulated and exported to Microsoft Software - Excel, providing support for the formulation of tables, graphs and statistical analysis of the hospitalization profile.

The data search was carried out in September, October, November and December 2021. For the refinement and discussion of the collected materials, searches indexed in the SciELO, LILACS and

BDENF databases were evaluated, using the following descriptors: Burns (Queimaduras); Accidents prevention (Prevenção de Acidentes); Health education (Educação em Saúde). As exclusion criteria, the following were established: studies outside the estimated period of analysis, research found outside the determined databases.

As it is a retrospective study, based on secondary data, there was no need for evaluation by the ethics committee in research with human beings, however, the work was carried out with scientific rigor in order to produce relevant and reliable results.

**RESULTS**

According to data collected on the DATASUS platform, between the years 2011 to 2021, the number of people hospitalized for burns in the state of Pará was 6,549, in which it was observed that male patients represented more than half of the reported cases (66.26%) compared to female patients (33.73%). As shown in Table 1, the Metropolitan I health region was the one that reported the most cases (20.22%) where there were high rates of

Table 1 - Hospitalization rate by gender - 2011 to 2021

Health Region	Male	Female
Araguaia	160.197	236.185
Baixo Amazonas	170.031	304.937
Carajás	164.096	302.898
Lago de Tucuruí	57.665	122.519
Metropolitana I	689.014	972.173
Metropolitana II	65.445	108.506
Metropolitana III	190.331	321.092
Rio Caetés	119.347	225.096
Tapajós	52.973	81.629
Tocantins	134.507	263.860
Xingu	111.675	163.278
Marajó I	34.182	64.896
Marajó II	57.834	111.422

Source: DATASUS, 2011 to 2021.



hospitalized men (65.95%) when related to cases of female patients (34.04 %).

Regarding the age group, summarized in Graph 1, it can be seen that adults have a higher occurrence of hospitalizations for burns (43.45%) as well as children,

which show the second highest rate of notifications (38.28%) compared also to adolescents (13.05%) and elderly (5.16%). Adults (20 to 59 years old) and children (1 to 9 years old) represented the majority of reported cases (81.78%), which demonstrates a higher risk among these age groups.

In Table 2 it is possible to identify the data related to color/race, the results show that people of mixed color appear predominantly among the reported cases (95.5%) and that white (2.3%), black (1.24%), yellow (0.8%) and indigenous people (0.1%) represent less than 1/8 of patients.

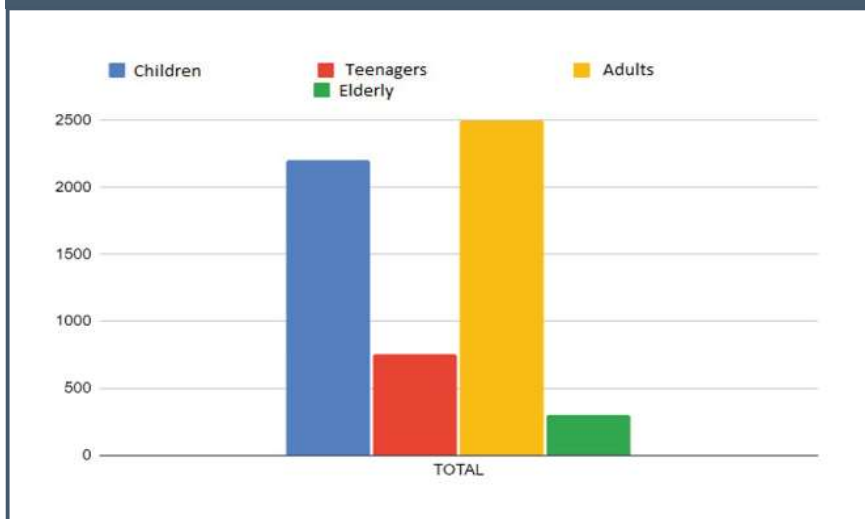
## DISCUSSION

The findings of the study show that burns were more frequent in adult males (20 to 59 years), which corroborates with Brazilian scientific evidence that points out that it is in the work environment that these accidents due to burns happen, while women get burned while carrying out household chores.<sup>12,13</sup>

Men are in greater numbers performing activities that require more physical effort, which consequently generates more risks in exposure to work accidents, such as accidents in the electricity network and handling of chemical substances, the most exposed professions are civil construction and the industrial area. Therefore, the male gender continues to be the one at greatest risk, requiring constant campaigns to prevent accidents at work.<sup>14</sup>

This data reaffirms the result of a national study extracted from the bank of the National Sentinel Services System for Vigilance of Violence and Accidents (VIVA Sistema Nacional de Serviços Sentinelas de Vigilância de Violências e Acidentes), which evaluated the attendances resulting from burns for a period of 30 days, poin-

Graph 1 - Distribution of hospitalizations by age groups, Brazil 2011-2021.



Source: DATASUS, 2011 to 2021.

Table 2 - Distribution of the sampling of hospitalizations according to the color/race of the inmates

Color/Race	Sampling
White	841
Black	511
Yellow	618
Brown	108.650
Indigenous	0

Source: DATASUS, 2011 to 2021.

ting out the predominance of men (450 cases; 57% of the total) in relation to women (339 cases; 43% of the total).<sup>1</sup>

This finding is related to work accidents that result in damage to workers' health, leading to physical and psychological limitations. As a way of mitigating the risks of these accidents, public bodies are responsible for implementing and executing the National Plan for Safety and Health at Work, and later, check whether employers are providing favorable conditions for the maintenance of workers' health, through the provision of periodic training, working hours appropriate to the function, adequate physical environment, machines in working order and provision of personal protective equipment.<sup>15</sup>

In assessing the age group, the research results show that in Pará, adults aged 20-59 (43.45%) are in first place among burn accidents, followed by children aged 1-9 years (38.28%), preceded by adolescents aged 10-19 years (13.05%) and elderly people > 60 years (5.16%), respectively.

With regard to the higher percentage of burns in adults, in addition to what was mentioned about work accidents, the home environment is also responsible for this finding. Among the causes of these burns we have the one caused by electricity which, according to the 2020 yearbook of the Brazilian Association for the Awareness of Electricity Hazards (Abracopel), there were 1,662 accidents of electrical origin in the country during a year, in whi-

ch 56% were due to shock, 39% overload fires and 5% atmospheric discharges.<sup>16</sup>

From the result of the electric shock of the same study, of the 909 records, 697 were fatal, where Pará leads the ranking in the northern region. The occurrence of this event is due to electrical hacks, old electrical installations, lack of maintenance, the use of the same outlet to connect different equipment at the same time and the lack of knowledge of the risks. An aspect to be highlighted is the increase in cases involving cell phone chargers for both shock and fire, and it is necessary to reinforce that the cell phone should not be handled while charging, do not use headphones with a cell phone connected to the socket, among others.<sup>16</sup>

Another cause that should be taken into account is the burn caused by flammable agents, which occurs due to carelessness/lack of attention or carelessness of others, and its severity depends on the agent and the exposure time. The highest incidence cases are caused by explosion or contact with direct flame causing multiple injuries throughout the body, the main agents are alcohol, gasoline and cooking oil. In this situation, a study reinforces that people do not read the information contained on the label of the flammable product before handling it.<sup>17</sup>

Unintentional burns in children aged one to four years were the fifth leading cause of death and the third among children aged five to nine years, where more than 50% of these accidents are caused by steam from hot water.<sup>18</sup> One should be concerned about the complications that may arise, as it is a phase of physical development and the loss of tissues and/or their contracture in the evolution of the lesions can cause permanent damage.<sup>19</sup>

Also according to the aforementioned author, scalding is the main source of domestic burns in children, caused by overheated liquids, such as water, tea, coffee, milk or immersion in water for bathing. This finding refers to the need to support burn prevention policies aimed at families, given that the home environment has high exposure to risks linked to

caregivers' negligence, children's curiosity and inadequacy of spaces, favoring burns by liquids, hot objects, household equipment, in addition to exposure to electrical current.<sup>20</sup>

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Studies show that precarious, small houses with a high number of residents, with low socioeconomic status and built with wooden boards are more vulnerable to fire and burns at home. It is considered

necessary to investigate these factors in our community with the help of epidemiological studies, to implement strategies for the dissemination of educational and preventive practices according to the characteristics of the population.<sup>21</sup>

The guidelines related to prevention aim to reduce children's access to any agent that causes burns present in homes. In this way, they are encouraged to implement changes in the domestic environment, such as: use of railings that prevent children from accessing the kitchen, sockets protected by appropriate covers, keep flammable products in high and locked places, leave hot food and liquids in the center of the table with the pan handles facing inwards, avoid caring for or carrying children on your lap while handling pans on the stove, among others.<sup>22</sup>

In relation to the hospitalization rate by color/race, it was found that the self-declared brown people were the most expressive percentage, being analyzed from two aspects, the first taking into account that according to the 2010 demographic census, in Pará, 70% of the population considers themselves mixed race, inferring that this result is due to this representation of pardos in the state. However, the second perspective of this finding is due to the historical fact that these people live in precarious housing, with few rooms, with excessive housing density and working without formal ties and labor protection.<sup>23</sup>

These social factors are related to the risk factors for burns already mentioned, due to the situation of precarious housing and jobs with risk of accidents at work. The census also reinforces this analysis when we compare the two largest Brazilian municipalities, São Paulo and Rio de Janeiro, in which black or brown people residing in a subnormal agglomeration were more than twice as high as that of white people.<sup>24</sup>

## CONCLUSION

With this study, it was possible to show that burns are more frequent in males in adulthood, reinforcing the need to pro-

mote the prevention of burns in the professional environment. Another highlight was care in the home environment, which, in allusion to studies on the subject, points to the home as the highest number of occurrences, mainly due to the presence of children and flammable agents. There-

fore, this study aims to bring the reflection that nurses, in addition to having scientific knowledge in providing care to burn victims, should also be concerned with filling in and analyzing statistical data, outlining accident prevention strategies, identifying the main causes to later develop heal-

th education for the population. In this sense, further studies are needed with an approach to the subject and the adoption of public policies for the prevention of burns that aim to reach schools, work environments, homes, among others, aiming to reduce burn rates in the country.

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