

## Deaths due to accidental submersion in southern Brazil



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### ABSTRACT

**Introduction:** Drowning is the alteration of respiratory function at the level of the trachea, bronchi or lungs, through airway obstruction resulting from submersion/immersion in a liquid medium. The main risk factors for drowning include alcohol and drug use, lack of swimming skills, and a variety of circumstances, including natural disasters and maritime incidents. Drowning mostly happens in children under the age of five, adolescents under the age of 15, and the elderly. **Objective:** To identify and understand the rates of deaths due to accidental submersion in adults in the southern region of Brazil in 2021. **Method:** This was a descriptive exploratory study with a quantitative approach. Data collection took place through access to the Ministry of Health's health data platform DATASUS, in the Tabnet health information tab originating from the Mortality Information System (SIM). **Results and discussion:** In 2021, 79 deaths due to drowning were identified in the southern region of Brazil. Of these, 67 (85%) were male and 12 (15%) were female. Regarding male deaths, 37 (47%) occurred in the hospital and 30 (39%) were identified at home. For females, 4 (33%) deaths occurred in the hospital and 8 (67%) at home. There was a prevalence for both sexes and in both environments, whether hospital or home, they are adults between 20 and 59 years old, with a mean age of approximately 38 years, and most of the time associated with the lack of appropriate supervision. The predominance in relation to race/color was white, with an average of 100% for females, and 49 males (73%), followed by 24% for brown race/color and 3% for black race/color. **Conclusion:** The incidence of deaths from drowning in the southern region of Brazil in 2021 was higher among hospitalized adult men aged 20 to 59 years, according to literary information. It is understood that drowning is a public health problem and that the spheres of power should spare no effort to reduce the number of deaths from this preventable cause.

**Keywords:** Drowning, Wounds and Injuries, Nursing.



## 1 INTRODUCTION

Drowning is the alteration of respiratory function at the level of the trachea, bronchi or lungs, through the obstruction of the airways resulting from a submersion/immersion in a liquid medium and which, by influencing the supply of blood oxygenation, causes a systemic compromise to all organs and tissues. It is one of the leading causes of preventable death in the world (NETO, 2022).

Drowning can lead to two outcomes, the death of the drowning individual or recovery through rescue that interrupts drowning (BERNOCHE et al., 2019)

In the last decade, more than 2.5 million deaths have occurred due to drowning, with 236,000 people dying each year and 40 every hour. It should be noted that 90% of these deaths occur in low- and middle-income countries (PAHO, 2023).

Risk factors for this trauma include alcohol and drug use, lack of knowledge of swimming and aquatic risks, and water transport (WHO, 2014). Drowning deaths can occur accidentally, related to natural disasters, maritime transport (CENDERADEWI; DEVINE; SARI; FRANKLIN, 2023).

Drowning mostly happens in children under the age of five, adolescents under the age of 15, and the elderly. When looking at the main causes or responsible for the occurrence of this emergency situation, men are listed, age less than 25 years, inadequate adult supervision, alcohol or other substance intoxication (present in up to 70% of cases), undiagnosed cardiac pathologies, epilepsy, trauma, hypothermia, suicide and homicide, and hyperventilation prior to diving (NETO et al., 2022).

The abuse of illicit and psychoactive substances, such as cocaine, when associated with the use of alcoholic beverages, was considered a factor directly proportional to the increase in the number of accidents due to submersion with consequent death. These data reflect the situation in Rio Grande do Sul, where associations were also found with male gender, age group between 30 and 50 years and medium to low income. (TOWERS; ARBO, 2020)

The Pan American Health Organization (PAHO) points out six low-cost evidence-based drowning prevention interventions, namely: 1) training people in safe rescue and resuscitation; 2) establish and comply with safety standards for navigation, shipping, and ferries; 3) improve flood risk management at the local and national level; 4) install barriers to control access to water; 5) provide safe places away from water for preschoolers, with trained child care; 6) teach school-age children basic swimming skills, water safety, and safe rescue (PAHO, 2023).

In this context, it is necessary to identify how mortality rates from the disease behave in other regions of the country, considering that many risk factors are avoidable and/or preventable, so the following question was raised: What are the rates of deaths due to accidental submersion among adults in the southern region of Brazil in 2021?



## 2 OBJECTIVE

To identify and understand the death rates due to accidental submersions in adults in the southern region of Brazil in 2021.

## 3 METHOD

This was a descriptive, exploratory study with a quantitative approach. Data collection took place through access to the Ministry of Health's health data platform DATASUS, in the Tabnet health information tab originating from the Mortality Information System (SIM).

The data search was carried out in August 2023, using the following filters: I) Age, II) Sex, III) Color/Race, IV) Place of occurrence, which was divided between hospital and home death. Schooling was not assessed due to the lack of registration in the DATASUS system. The "accidental drowning and submersion" segment of the ICD-10 group was also used as a filter that allowed the identification of only data referring to deaths due to drowning that occurred in 2021.

The collected data were organized and tabulated in Microsoft Excel software, version 2019, for follow-up with statistical analysis and interpretation. After data collection, the analysis was performed using descriptive statistics grouping the selected variables, namely: sex, age, color/race (white, black, yellow, brown, indigenous).

Regarding the ethical aspects of research development, as these are data in the public domain and linked to the Ministry of Health and in accordance with Resolution 674/2022 of the National Health Council, it was not recommended to submit it for consideration by the Research Ethics Committee (CEP).

## 4 RESULTS AND DISCUSSION

In 2021, 79 deaths from drowning were identified in the southern region of Brazil. Of these, 67 (85%) were male and 12 (15%) were female. Regarding male deaths, 37 (47%) occurred in the hospital and 30 (39%) were identified at home. For females, 4 (33%) deaths occurred at home and 8 (67%) at home.

In terms of age, there is a prevalence for both sexes and in both environments, whether hospital or home, they are adults between 20 and 59 years old, with a mean age of approximately 38 years, and most of the time associated with a lack of appropriate supervision (GOMES, 2017).

The predominance in relation to race/color was white, with an average of 100% for females, and 49 males (73%), followed by 24% for brown race/color and 3% for black race/color.

The data found in this study are corroborated by Nunes et al. (2023), who identified the variables related to drowning in the State of Alagoas. The above-mentioned authors reinforce the prevalence of deaths of men due to drowning, but it differs when observing the color of the individuals,



and in the south of the country the prevalence is of white men and in the state of Alagoas the prevalence is of brown men.

When analyzing both sexes and the areas where the deaths occurred, it is evident that the male population is the most vulnerable to drowning accidents, corroborating the fact that men tend to take more risks. The data also suggest that men are more frequent in jobs that involve water activities and are less afraid, compared to women, of venturing into dangerous, unknown, and deep aquatic areas (KOON et al., 2021).

The evaluation of the use of alcohol, drugs, and pharmaceuticals in victims who died by drowning was the subject of an investigation in the State of Rio Grande do Sul by Torres and Arbo (2020). The authors reinforce the prevalence of the male profile and the contribution of the use of these substances to the unfavorable outcome of drowning patients.

In females, it is observed that although the results found are much lower when compared to males, they are still present. The results of this study are consistent with other studies that aim to identify data related to the epidemiology of drowning, since the morbidity of this condition is still underestimated.

Considering that death by drowning is a serious injury that requires rapid intervention, it is recommended that more effective educational campaigns be planned for its prevention, especially aimed at the adult male population, given the high incidence in this age group, as well as the need to obstruct places of high risk for drowning, such as non-coastal and non-tourist areas (GÓMEZ et al., 2019).

Because it is a preventable death, management, and identification of signs of drowning are essential for the survival of drowned individuals. In this sense, educational activities, and the use of resources for popular and professional training can influence the drowning rates. The dissemination of the steps to be followed in Basic Life Support and Advanced Life Support should be tools of continuous use by the community (CIBULSKI et al., 2023).

## 5 CONCLUSION

The incidence of deaths from drowning in the southern region of Brazil in 2021 was higher among hospitalized adult men aged 20 to 59 years, according to literary information.

Acknowledging the gender disparity in drowning incidents leads us to foster a sense of responsibility and vigilance, and underscores the importance of collaborative efforts among public health institutions, communities, and individuals to protect the health and lives of men in adulthood.

It is understood that drowning is a public health problem and that the spheres of power should spare no effort to reduce the number of deaths from this preventable cause.



In addition, the importance of health education, popular education and professional education is emphasized, which, when carried out, have the potential to significantly reduce mortality rates and poor outcomes of drowning individuals.



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