

Demographic Profile of Deaths Due to Drowning in and Around Vijayawada, Andhra Pradesh

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Abstract

Drowning is a leading and preventable cause of death that has suffered an attention deficit. The World Health Organization identifies data collection as a key strategy underpinning effective interventions. The circumstances leading to drowning are complex. People interact with water primarily for recreation and often interact with water due to daily life or occupational endeavours. A Significant reduction the number of drowning deaths among young children in private swimming pools has been achieved through over 30 years of focused work on the epidemiology and risk factors for drowning in private swimming pools among young children. Proposed contributory factors for drowning in rivers include a lack of barriers controlling access to water, an absence of adult supervision for young children, poor swimming skills, minimal awareness of the dangers, the consumption of alcohol, transportation on water, a lack of safe water supply, and disasters related to flooding.

Keywords: Awareness, circumstances, collection, complex, drowning, data, proposed, reduction

Introduction

Drowning is a leading and preventable cause of death that has suffered an attention deficit. The World Health Organization identifies data collection as a key strategy underpinning effective interventions. It is among the top 10 leading causes of death worldwide, with the drowning death rates at least three times higher in the developing countries than the developed countries.^{1,2} Despite the significant burden, drowning deaths continue to remain an invisible public health

issue in most developing countries.^{1,3} In continuing to bring action on drowning, this year, the WHO has released an implementation guide that provides practical steps for preventive measures to address the burden of drowning.⁴ According to the World Health Organization (WHO), 0.7% of all deaths worldwide — or more than 500,000 deaths each year⁵ — are due to unintentional drowning.⁶

The circumstances leading to drowning are complex. People interact with water primarily for recreation and often interact with water due to daily life or occupational endeavours. Prevention strategies, must therefore differ to suit the environment and the unique causal factors contributing to drowning risk in different contexts. Drowning occurs when an individual is unable to remain float in water. Complete submersion is not necessary. Submersion of nose and

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mouth alone for a sufficient period can cause death from drowning. Pathophysiological proof is often difficult or is even impossible to obtain. Drowning is the process of respiratory impairment from submersion or immersion in liquid and is considered a major global health problem ⁷.

Drowning is a global public health issue, with the WHO estimating 372 000 people die from drowning annually. The true burden of drowning is likely to be higher due to under-reporting, as victims are not hospitalised or cases are not recorded because of a lack of death collection tools in many low and middle-income countries. Some data on drowning are also excluded because of reporting methods such as the use of International Classification of Diseases (ICD) coding frameworks that mean drowning may be classified elsewhere or excluded if it is related to transportation or disaster. Drowning prevention interventions based on site-specific locations are likely to have a greater impact and prove more successful than general strategies aimed at preventing drowning. A significant reduction in the number of drowning deaths among young children in private swimming pools has been achieved through over 30 years of focused work on the epidemiology and risk factors for drowning in private swimming pools among young children.

Countermeasures intended to prevent or reduce drowning are most effective when evidence based. Research which delineates the nature and extent of the problem and identifies causal factors to be addressed via intervention is therefore an a priori step in countermeasure development ⁸. For drowning, the type of body of water (e.g. swimming pool, river, ocean etc.) is an important consideration which informs prevention efforts as the populations and circumstances of different water sites vary. ⁹ In most countries, unintentional drowning occurs more frequently at natural water sites, compared to pools or bathtubs. ¹⁰

Proposed contributory factors for drowning in rivers include a lack of barriers controlling access

to water, an absence of adult supervision for young children, poor swimming skills, minimal awareness of the dangers, the consumption of alcohol, transportation on water, a lack of safe water supply, and disasters related to flooding. ¹ Some proposed river prevention strategies include: community-based prevention; provision of safe places such as crèches for young children; basic swimming instruction for older children; increased public awareness of the vulnerability of children; legislation for safe boating; mitigation of flood risk; and continued research into priority areas.

Materials and Methods

The study has been carried out in the year 2020 after approval from ethical committee of NIMRA Medical College/General Hospital. 176 cases were taken to study on epidemiological profile of the drowning deaths, excluding bodies in advanced state of decomposition. The study was carried out over the period of April 2019 to May 2020, with the aim of studying various epidemiological parameters. The factors taken to enumerate the study are age, sex, marital status, region, socioeconomic status and comorbidity conditions.

Observations and Results

The cases taken were 176 and the study includes, only the dead bodies which were retrieved from water sources and having history of drowning, brought for post mortem examination. As per law of the land, consent of relatives is not required for carrying out the medicolegal post-mortem examination on the corpse of the deceased; hence it was not necessary to obtain consent from relatives or any other authority in this particular study. were present at the time of post-mortem examination, necessary information was collected regarding the personal, mental and behavioural aspect.

Table 1 shows, the drowning deaths were commonly seen in age groups of 21-30 years (27.84%) followed by 31- 40 years (22.73%) and 41-50 years

(18.75%). Predominance of male was seen in all age groups in drowning death except in the age group 0-10 years age group and 50-70 year age group shows female predominance with 13.73% cases in both. Among the total cases, 71.02% victims were male and 28.98% were female. The male: female ratio was 2.45:1.

Figure 1 shows marital status, 46.59% victims were married and 32.95% were unmarried. Among the females 56.86% were married and (25.49%) were unmarried, and among the males 42.40% were married and were (36%) unmarried. And remaining cases status is not known.

In figure 2, it is observed maximum number of drowning deaths had occurred in urban region constituting 57.38% cases followed by rural region constituting 42.62% cases. In urban region, the male (59.20%) drowning deaths are more as compared to females (52.94%), whereas in rural region the females (47.06%) drowning death are more as compared to males (40.80%).

Table 2 shows, students were the most common victims in drowning deaths seen in 18.75% cases, followed by non-working victims in 17.62% cases, farmer in 16.48% cases and labourer in 11.36% cases.

Table 3, depending on the socioeconomic status, most of the victims of drowning deaths belong to upper-lower class seen in 35.23% followed by lower class in 20.45% cases and lower middle class in 14.77% cases, and 6.25% of the victims of drowning death belong to upper class of socioeconomic status.

Table 4 shows, drowning deaths 21.02% of victims had familial and financial problems. The second most common history associated with drowning death was depression seen in 20.45% cases, followed by chronic alcoholism in 18.18% cases and chronic illness in 17.61% cases. Male predominance was seen in almost all of the associated history except psychiatric illness (7.38%) in which female outnumbered male in drowning deaths.

Figure 3 shows that the maximum number of drowning deaths occurred in rainy season (43.75%). This was followed by summer season (32.95%) and winter season (23.30%).

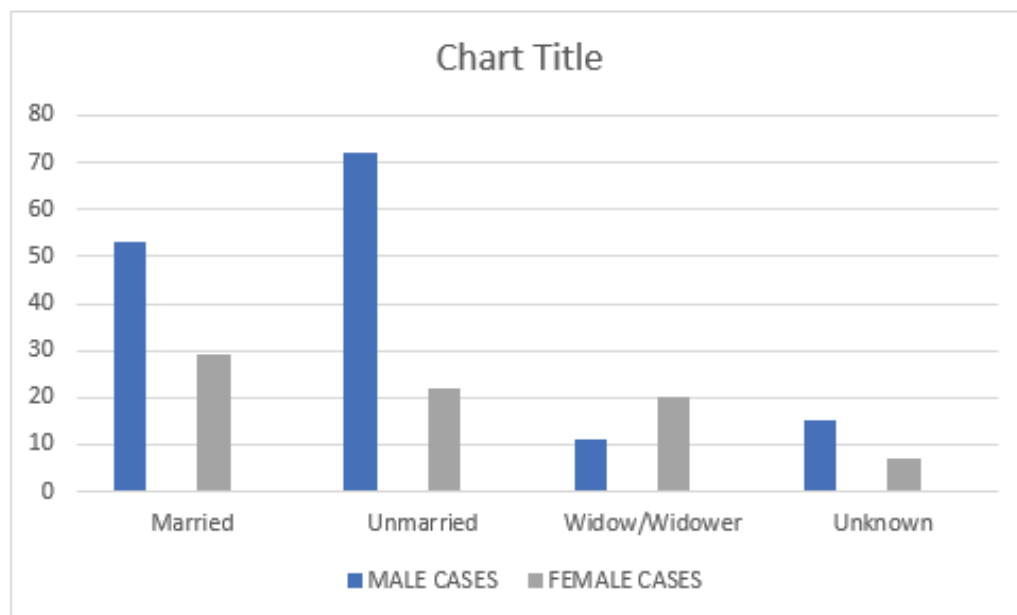


Figure 1 Distribution of drowning deaths as per Marital Status

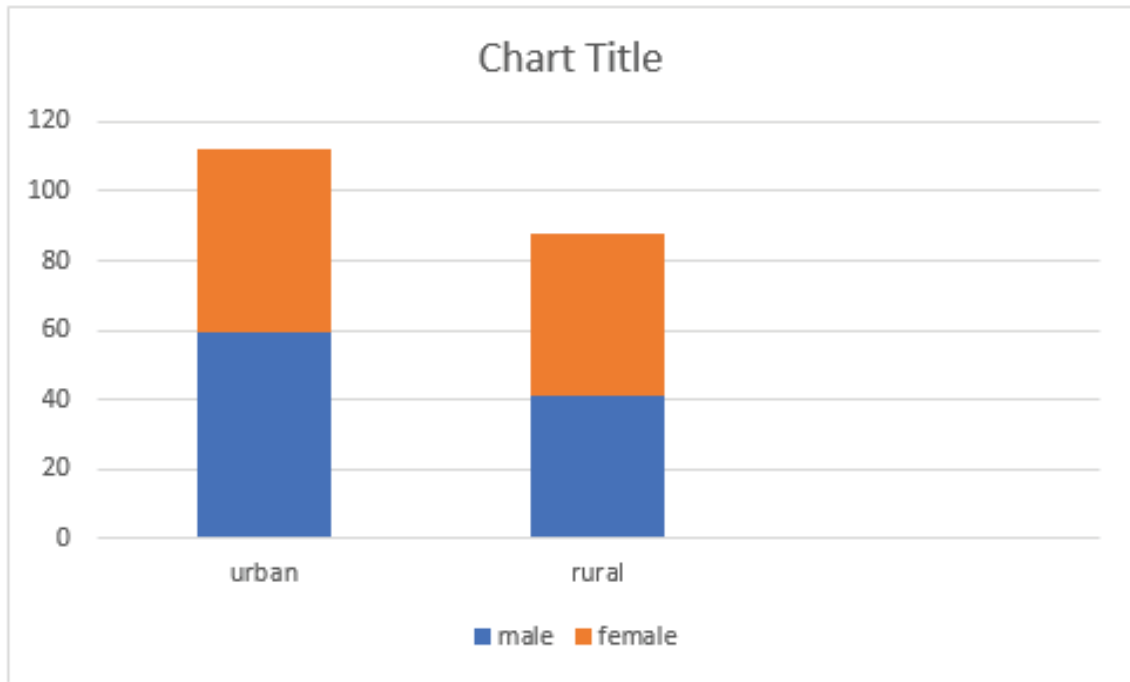


Figure 2 Region of Occurrence

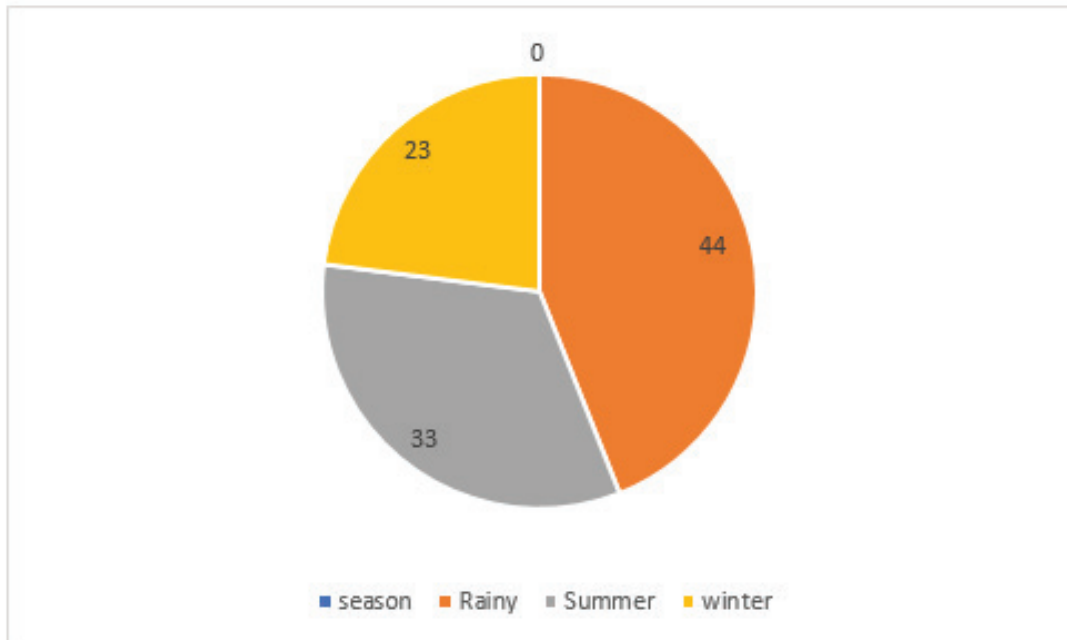


Figure 3 Seasonal Variation of Drowning Deaths

Discussions

The drowning deaths were predominantly seen in male (71.02%) with male: female ratio of 2.45:1, they were commonly seen in age groups of 21-30 years (27.84%) followed by 31- 40 years and 41-50 years. Predominance of male was seen in all age groups except below 10 years and between 50 and 70 years of age. These findings are consistent with that of Auer, Quan, Suresh Kumar Shetty and Shetty, Pathak and Mangal and Saberi Anary et al.¹² The probable reason behind preponderance of 21-30 years age group in drowning is carelessness and adventurous nature usually seen in youngsters while swimming or doing recreational activities in or around water source leading to accidental deaths. This is followed by the age group of 31-40 years, it may be due to familial and financial problems arising in life and their inability to deal with them.

As per marital status, 46.59% victims were married and 32.95% were unmarried. Among the females 56.86% were married and (25.49%) were unmarried, and among the males 42.40% were married and were (36%) unmarried. And remaining cases status is not known. It may be due to over exposure of married and working people in and around water sources leading to accidental deaths. Also, they prefer to commit suicide by drowning due to inability to handle familial and financial problems. This finding is consistent with that of Gorea and Singh Ranga Rao et al.¹³ who found 38% and 50% married victims respectively who died of drowning.

Maximum number of drowning deaths had occurred in urban region constituting 57.38% cases followed by rural region constituting 42.62% cases. In urban region, the male (59.20%) drowning deaths are more as compared to females (52.94%), whereas in rural region the females (47.06%) drowning death are more as compared to males (40.80%). These findings are in contrast to study carried out by Delmonte and Capelozzi and Murkey et al. This may be due to different region of study. The present study was

carried out in urban region in contrast to Murkey et al¹⁴ and Delmonte and Capelozzi which was conducted in rural region.

The most common victims of drowning deaths were the student seen in 18.75% cases. It may be due to carelessness and adventurous nature usually seen in youngsters while swimming or doing recreational activities in or around water source. This is followed by non-working victims in 17.62% cases, farmers in 16.48% cases and labourer in 11.36% cases; it is probably due to financial and familial problems,

Depending on the socioeconomic status, most of the victims of drowning deaths belong to upper-lower class seen in 35.23% followed by lower class in 20.45% cases, lower middle class in 14.77% cases upper class in 6.25% cases. In 13.07% cases, the socioeconomic status of the victims of drowning deaths was not known.

21.02% of victims of drowning death had familial and financial problems. The second most common history associated with drowning death was depression seen in 20.45% cases. This is followed by chronic alcoholism in 18.18% cases and chronic illness in 17.61% cases. Male predominance was seen in almost all the associated history except psychiatric illness (7.38%) in which female (15.68%) outnumbered male (4%) in drowning death. The present study is in accordance with Dietz and Baker¹⁵, Auer, Fralick et al.

The maximum number of drowning deaths occurred in rainy season (43.75%). This is followed by summer season 32.95% cases and winter season 23.30% cases. This finding is consistent with Pathak and Mangal, Job , Ambade et al.¹² studies where maximum drowning deaths were found in rainy season.

Conclusion

Drowning is a global public health threat, impacting both high income and low and middle income countries. Male predominance seen in drowning

deaths with highest incidence seen in third and fourth decades. Drowning deaths are most common in urban region followed by rural region. Students are the most common victims of drowning deaths followed by non-working, farmers and I. Understanding drowning risk factors aids in implementation of effective preventative strategies. Young children should receive swimming instruction and communities should implement daycares to ensure constant adult supervision, especially in the daytime. Additionally, small ponds and irrigation ditches should be encircled with fences or drained, and cisterns/wells covered by grates to prevent children from falling into them. Finally, programs to educate parents on the risks of drowning should be implemented and could help reduce the childhood drowning rate by 40%.¹⁶ These preventative strategies are especially important in rural areas where the risks of drowning are higher. The WHO in their Global Drowning Report also supports many of the recommendations included in this systematic review. Drowning literature is extensive and includes wide-ranging focus areas approached by multiple disciplines and various perspectives. This heterogeneity is both a challenge and a benefit. Standardisation in some areas would surely drive the science forward: consensus-based terminology and reporting practices would allow for richer data and improved comparisons across locations; a streamlined research agenda with identified objectives and prioritised questions to be addressed would propel prevention efforts towards the populations most in need; and established best practice for prevention program evaluation would ensure effective use of limited resources. Conversely, the disparate approach to drowning research in the past 60 years has allowed for creative investigation of essential, ground-level questions that has pushed boundaries and driven the field in new directions.

The next generation of drowning and safety science must build upon the advances of previous work by recognizing which areas have been studied thoroughly and where further attention is needed

most. Coastal drowning researchers must address gaps in research from lower resourced settings and the lack of prevention strategy evaluation. The multidisciplinary nature of drowning research offers collaborative opportunities to advance science underpinning prevention efforts seeking to save lives and keep people safe.

Ethical Clearance: This study has been carried out in the year of 2020, from the ethical committee of NIMRA Institute of Medical Sciences and Hospital, Vijayawada, Andhra Pradesh

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