

# Epidemiological Study of Drowning Deaths in Madurai Region

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## Abstract

**Background:** World Health Organization described drowning as serious and neglected public health problem. Nearly about 42 people every hour and 3.7 lakh people every year die due to drowning in the world.

**Method:** The present study was undertaken at Government Medical College and Hospital located in Madurai on dead bodies brought for postmortem. The study was carried out during the period of January 2017 to December 2018 on 80 cases to study the various epidemiological parameters of drowning.

**Results and Conclusions:** We have concluded that 75% victims were males and 25% were females. Drowning deaths were commonly seen in age groups of 11 to 20 years (25%). Maximum no of drowning deaths had occurred in urban region constituting 52% followed by rural region of 48%. Study also revealed majority of the victims were students constituting males 67% and females 33%. Number of victims of drowning deaths has familial and financial problems in males 78% and females 22%, depression seen in males 71% and females 29%. Number of drowning deaths occurred in September 16.5%. Most of the drowned victims were retrieved from river 59%, Wells 25%, Pond 29%.

**Keywords:** Drowning deaths, site of drowning, seasonal variation, regional variation, occupation status, personal history.

## Introduction

The well-known fact saying “water is life” reveals a fact that there is no existence without water. Water is essential for life but at the same time it can also take your life. In addition to life sustaining role, water acts as one of the most destructive forces on earth in the form of tsunami and floods which becomes the cause of loss of life of many people. So water could be said as “double edged sword”. WHO has adopted new definition on drowning in 2002 as “Drowning is the process of experiencing respiratory impairment from submersion or immersion of liquid”. WHO described drowning is one of the top 5 causes of death in children between 1 and 14 years and one of the ten leading causes of death between 1 and 24 years. As per the National Crime Records Bureau-Accidental Deaths and Suicides (2012),

eighty persons die of drowning each day in India, which accounts for 7.4% of all unnatural deaths.

## Materials and Methods

The above study was done at Government Rajaji Hospital, Madurai Medical college, Madurai, where nearly 4000 medico-legal autopsies are carried out each year. We have done a study on epidemiological profile of the drowning deaths. The study was carried out over the period of two years that is from January 2017 to December 2018. In this period we received 80 cases excluding bodies in advanced state of decomposition. The study includes, only the dead bodies which were retrieved from water resources, having history of drowning, brought for post mortem examination. Detailed history and relevant information was collected from police inquest and requisition regarding the age, sex, marital status, occupation, religion, etc.

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## Results

In our study from the period January 2017 to

December 2018 we received 80 cases.75 % of victims were males and 25 % were females.Drowning deaths were most commonly seen in the age groups of11 to 20 years[25 %].Maximum number of drowning deaths had occurred in urban region constituting 52% followed by rural region constituting 48%cases.Study also revealed that majority of the victims was students constituting males 67% and females 33%. Number of victims of drowningdeaths has familial and financial problems in males 78% and Females 22% and Depression seen in males 71% and females 29%.Number of drowning deaths occurred in the month of September 16.5 % .Most of the drowned victims was retrieved from River59%, wells 25 %, Pond9%.

Table No - 1

Sex	Number of cases	%
Male	60	75%
Female	20	25%
<b>Total</b>	<b>80</b>	<b>100%</b>

Table No -2

**Age Wise Distribution**

Age	Number of cases	%
0/10	17	21%
11-20	20	25%
21-30	10	13%
31-40	9	11%
41-50	10	13%
51-60	4	5%
61-70	4	5%
More than 70	6	7%
<b>Total</b>	<b>80</b>	<b>100%</b>

Table No – 3: Place of drowning

Place	Number of cases	%
River	47	59%
Well	20	25%
Pond	7	9%
Water pit	5	6%
Water tank	1	1%
<b>Total</b>	<b>80</b>	<b>100%</b>

Table No- 4

	Male	Female	Male%	Female %
Student	16	8	67%	33%
Farmer	15	0	100%	0%
Labourer	20	5	80%	20%
Business	7	0	100%	0%
Unknown	2	5	29%	71%
House wife	0	2	0%	100%
<b>Total</b>	<b>60</b>	<b>20</b>		

Table No – 5

**Month wise Distribution**

Month	Number of cases	%
Jan	3	3%
Feb	4	5%
Mar	9	11%
Apr	6	8%
May	3	4%
Jun	3	4%
Jul	6	8%
Aug	7	9%
Sep	13	16%
Oct	8	10%
Nov	9	11%
Dec	9	11%
<b>Total</b>	<b>80</b>	<b>100%</b>

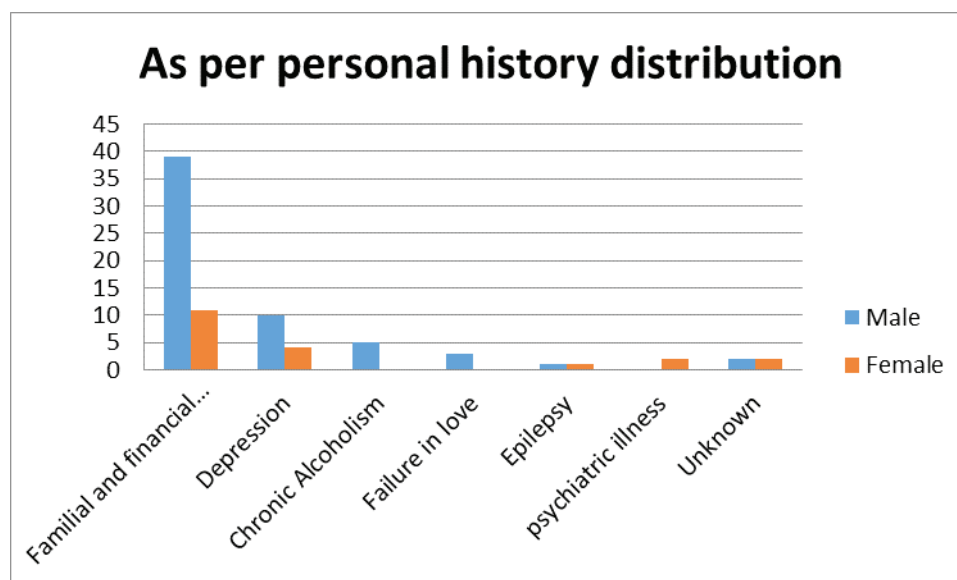


Chart No 1

### Discussion

The drowning deaths were predominantly seen in male amounting to 75 % involving the age groups of 11 to 20 years followed by 0 to 10 years. These findings are consistent with that of Auer[1990]<sup>(1)</sup>, Quan[2003]<sup>(2)</sup>, Suresh Kumar Shetty and Shetty [2007]<sup>(3)</sup>, Pathak and Mangal[2009]<sup>(4)</sup>, and SaberiAnary et al [2010]<sup>(5)</sup>. Probable reason for drowning in 11 to 20 years is due to adventurous nature, intoxication, carelessness seen in youngsters while swimming in water. Drowning in 30 to 40 years due to familial and financial problems arising in life and their inability to deal with them. Maximum number of drowning deaths occurs in urban region constituting 52%, followed by rural region about 48%. These findings are in contrast to study carried out by Delmont and Capelozzi [2001]<sup>(6)</sup> and Murkey et al<sup>(7)</sup> due to region of study.

In drowning deaths males 78% and females 22% had financial and familial problems and depression was seen in males 71% and female 29%. The present study in accordance with Dietz and Baker [1974]<sup>(8)</sup>, Auer[1990]<sup>(1)</sup>, Fralick et al [2013]<sup>(9)</sup>.

The maximum number of deaths occurs in September month [16.5 %]. this is followed by November and December month as 11.25 %, followed by March 11.5 %. This finding is consistent with Pathak and Mangal[2009]<sup>(4)</sup>, Job[2009]<sup>(10)</sup>, Ambade de et al[2013]<sup>(11)</sup> studies state

maximum death in rainy season.

Most of the drowning victims were retrieved from river [58.75 %], wells[25 %], pond[8.75 %] this is in contrast with Fralick et al[2013]<sup>(9)</sup> and RangaRao et al[2014]<sup>(12)</sup> according to the place of drowning.

### Summary and Conclusion

In the above study we conclude that males show predominance to females, in drowning deaths with highest incidence seen in age group of 11 to 20 years. Drowning deaths are common in urban region followed by rural region. The study concluded that students were the prey to drowning as a result of their adventurous carefree nature and various forms of intoxication. Familial and financial problems are the most common history in drowning deaths followed by depression. Drowning deaths are most common in rainy season compared to winter season, followed by summer season. River was found to be the most common site of drowning followed by wells and ponds.

**Ethical Clearance:** Not needed as it is a retrospective study.

Source of Funding: Self

**Conflict of Interest:** Nil

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