

CHILDREN DEATHS BY FALLING FROM A HEIGHT GENERAL AND DEMOGRAPHIC ASPECTS

Dr. Laura Lele*, Prof. Dr. Radu Spineanu*, Dr. Simona Cheregi*, Dr. Cristian Sava*

*University of Oradea, Faculty of Medicine and Pharmacy, Piata 1 Decembrie, No.10 , Oradea,
Romania

Abstract

Study of children's deaths by falling from height and its correlation with demographic, epidemiological, ethiological and anatomo-clinical factors.

Key words: child, demography, height, trauma

INTRODUCTION

Fall from height is defined as the passage of a body from a higher to a lower level under the action of gravity and possibly of an additional force, without using a coordinated movement or special means of support.

MATERIAL AND METHOD

During 2003-2012 Legal Medicine Department Bihor performed and recorded a number of 7132 necropsies. 182 cases were a result of deaths by falls from height (2.55%). Of these, 58 cases were minors (31.87%). Besides autopsy protocols, clinical documentation of hospitalized cases was studied too. Results of familial, social and criminal accidents were also consulted.

RESULTS AND DISCUSSIONS

Most deaths by falls from height were reported in the years 2003-2012 with 8 cases each, accounting for 13.79%.

Lethality index of trauma produced by falling from a height in minors was 6.39% during 2003-2012 period. Highest lethality was recorded in 2010 (16.28%) and the lowest in 2009 (3.70%). During the reported period, mortality evolved sinusoidally, increasing until 2010.

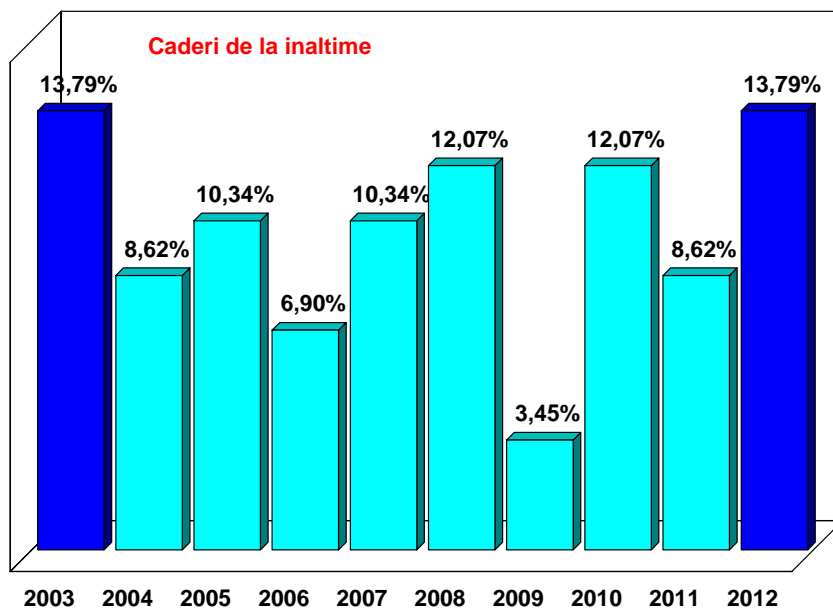


Figure 1 Annual distribution of deaths

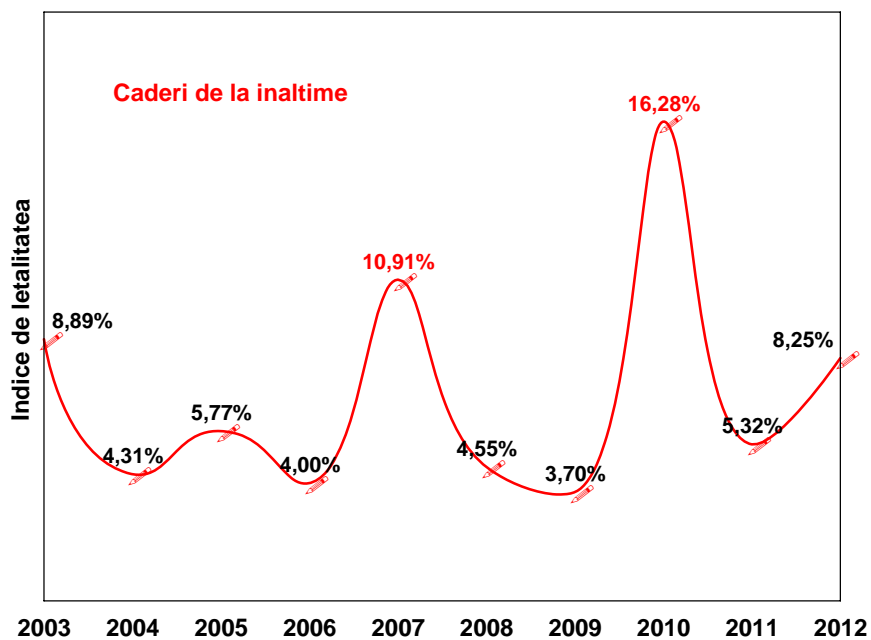


Figure 2 Evolution of the lethality index during 2003-2012

Most deaths occurred in boys (72.41%), the ratio boys / girls was 2.6:1. Lethality index among children victim of falls from height was unsignificantly higher in boys compared to girls (6.59% vs 5.93%) ($p = 0.179$). We can not say that there is a higher risk of death in boys with injuries from falls from height than girls ($RR = 1.113$, $R = 0.007$). Risk of fatal injury was the same.

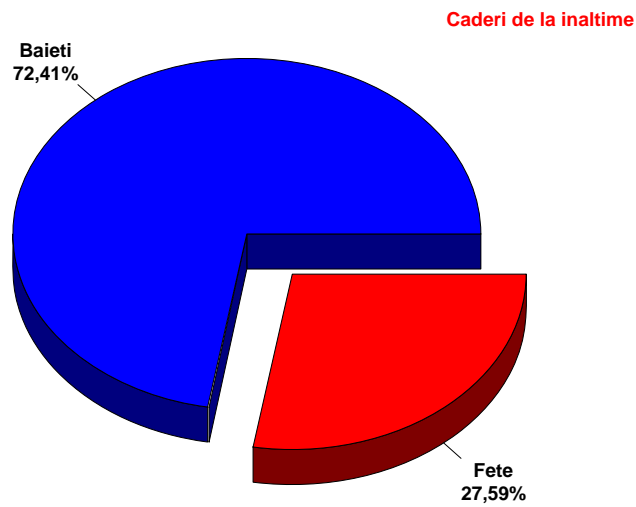


Figure 3 Distribution of deaths by gender

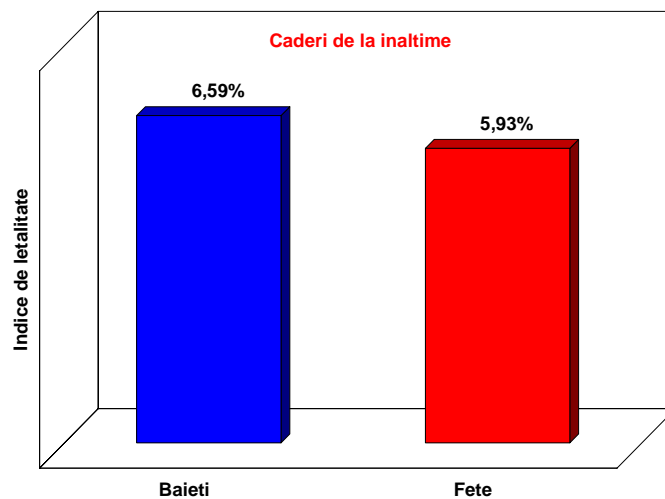


Figure 4 Lethality index by gender

Most deaths occurred in children aged between 4 to 6 years (32.76%); no deaths were recorded in infants.

The highest lethality index was recorded in the age group 4-6 years (12.34%), followed by the age group 1-3 years (12.12%), significantly higher than in groups of 4-10 years old and 11-16 (3.83% and 5.15%) ($p = 0.033$).

The risk of death in children with trauma by falling from a height is almost 3 times higher in age group 1-6 years than in the other groups (RR = 2.968, R = 0.081).

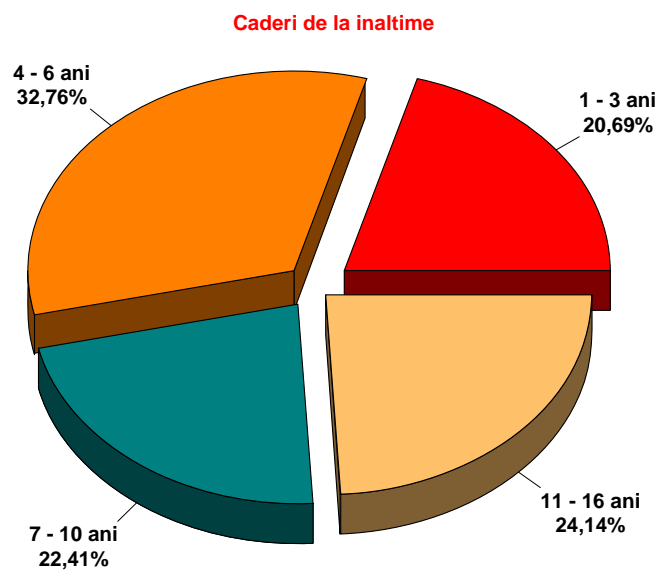


Figure 5 Distribution of deaths by age

The highest mortality recorded in 4-6 years and 1-3 years age groups was the expression of major vulnerabilities of the morphological structures and multi-functional disbalance of the human body at that ages. All these children died instantly on impact or survived less than an hour.

Most deaths were among children from rural areas (55.17%), the ratio of rural / urban being 1.2: 1.

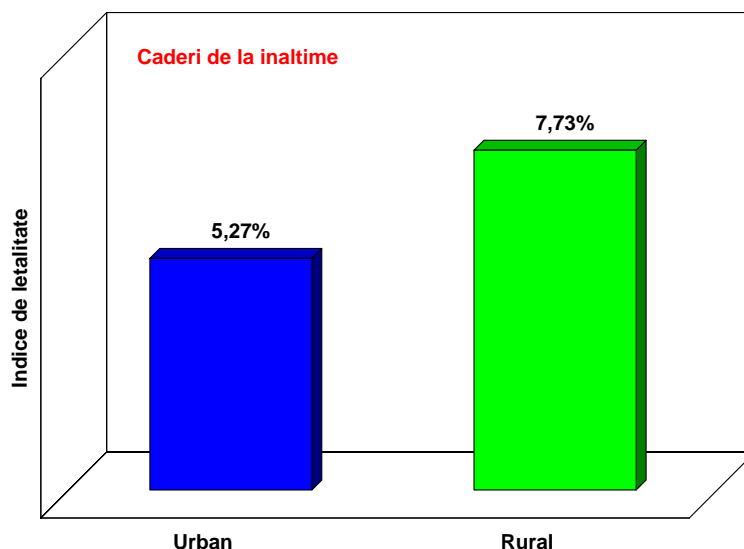


Figure 6 Lethality index related to environment

In the group of children with trauma caused from falls from height lethality index was significantly higher in rural than in urban areas (8.24% vs 5.40%) ($p = 0.047$).

The risk of death in children with trauma by falling from a height is 1.5 times higher in rural areas than in urban areas ($RR = 1.534$, $R = 0.029$).

In urban areas most dangerous falls are from the upper floors of apartment buildings. In rural areas is more likely to find locations potentially lethal in case of falling: many very tall trees, slopes and hilltops and mountains, precipices. Children, usually less supervised by adults than those in urban areas are often not found immediately, ambulances arrive with difficulties at the scene, professional assistance is delayed.

Distribution of victims according to parental studies indicate that most deaths were registered in children whose parents graduated secondary education (56.90% mothers and 53.45% fathers, respectively). Parents of children who died by falling from a height having university education encountered for 15.52%.

Highest lethality index was recorded in children having mothers with secondary education (7.97%) and fathers with basic education (7.56%).

Table 1.

Distribution of deaths by falling from height related to parental education

Education	Mother			Father		
	No of deaths	%	Lethality index (%)	No of deaths	%	Lethality index (%)
Illiterate / elementary school	16	27,59	4,97	18	31,03	7,56
Secondary education	33	56,90	7,97	31	53,45	6,40
University education	9	15,52	5,73	9	15,52	5,36
Not specified	0	0,00	0,00	0	0,00	0,00

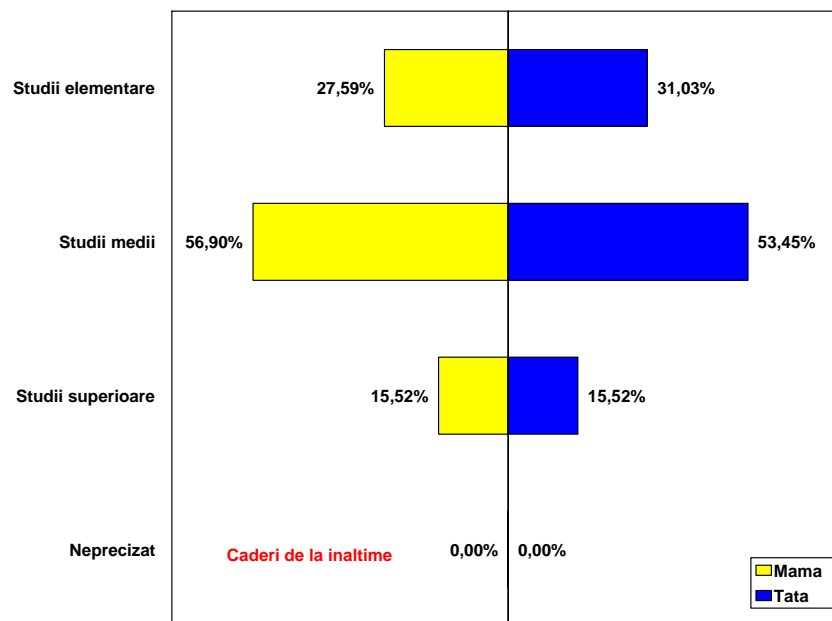


Figure 7 Distribution of deaths by falling from height related to parental education

Lack of education or a superficial, inadequate parental education explain their lack of concern for the supervision of young children or training of older children in order to achieve a responsible behavior to avoid accidents, which led minors to ignorance regarding the imminence and severity of the hazard. Deaths by falling from a height of children whose parents had higher education was due to a lack of attention or negligence for

short periods of time, fatigue, present concerns or malfunction of couple relationships.

Parental socio-economic status indicates that most deaths were registered in children from families with average socio-economic status (46.55%). In nearly a third of cases (31.03%) socio-economic status has been lowered or placed at risk of poverty.

Table 2

Distribution of deaths related to parental socio-economic status

Socio-economic status	No of deaths	%	Lethality index (%)
High	13	22,41	16,88
Average	27	46,55	4,85
Low/poverty	18	31,03	6,59

It is interesting to note that the lethality index was significantly higher in children from families with high socioeconomic status (16.88% vs 4.85% and 6.59%, respectively) ($p < 0.001$).

Authors who have studied the phenomenon have determined that the poor and uneducated families, marked by unemployment or absolutely insufficient income, with many children, with overcrowded housing and lack of the most elementary comfort, living in disadvantaged neighborhoods with more severe conflict situations, children are extremely exposed on one side to a large number of accidents, and on the other hand the trauma are often more severe.

Among children with pre-existing pathology 14 deaths were recorded, representing 24.14% of all deaths. Of these, 35.71% had mental retardation, 28.57% abnormal neuro-motor behavior, 21.43% intoxication (alcohol, drugs) and 14.29% sensorial disabilities.

Table 3

Distribution of deaths by preexisting pathology

	No of deaths	%	Lethality index (%)
Pre-existing pathology	14	24,14	18,91
Neuro-motor anomalies	4	28,57	57,14
Mental retardation	5	35,71	45,45
Senzorial disabilities	2	14,29	40,00
Intoxication (alcohol, drugs)	3	21,43	21,43
No pre-existing pathology	44	75,86	5,28

Lethality index was significantly higher among children with preexisting pathology versus those without (18.91% vs 5.28%) ($p < 0.001$).

CONCLUSIONS

In terms of demographics constants, risk of death by falling from a height in children is determined by age, area of origin, level of education of parents and family socio-economic standard, pre-existing pathology, and their gender.

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