

# CHARACTERIZATION OF ELDERLY ACCIDENT VICTIMS DUE TO EXTERNAL CAUSES

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**ABSTRACT:** The objective in this quantitative and retrospective study was to characterize accident events in elderly victims due to external causes, attended by a Mobile Emergency Care Service in a city in the State of Paraná, Brazil. The sample consisted of 324 events, during the sample period from June to December 2009. The ethical premises were respected in the study. Most of the victims were female (N=179; 55.25%), in the age range from 60 to 65 years, suffering from Systemic Arterial Hypertension (N=80; 24.69%) and Diabetes Mellitus (N=33; 10.18%). Events at home were significant (N=171; 52.78%); the highest incidence level was related to falls from the same height (N=185; 57.10%), followed by ground transportation accidents (N=73; 22.52%). The importance of actions by the multiprofessional health team is highlighted, focused on the prevention of accidents due to external causes in the elderly population, emphasizing information about risks and preventive care in cases of falls from the same height at home.

**DESCRIPTORS:** Aged; External causes; Accidental falls

## CARACTERIZAÇÃO DE IDOSOS VÍTIMAS DE ACIDENTES POR CAUSAS EXTERNAS

**RESUMO:** Estudo quantitativo retrospectivo, cujo objetivo foi caracterizar as ocorrências em idosos vítimas de acidentes por causas externas, atendidos por um Serviço de Atendimento Móvel de Urgência, em uma cidade do Estado do Paraná, Brasil. A amostra compreendeu 324 ocorrências no período amostral de junho a dezembro de 2009. Foram respeitados os preceitos éticos no estudo. A maioria das vítimas era do sexo feminino (n=179; 55,25%), na faixa etária de 60 a 65 anos, com Hipertensão Arterial Sistêmica (n=80; 24,69%) e Diabetes Mellitus (n=33; 10,18%). Foram significativas as ocorrências nos domicílios (n=171; 52,78%); a maior incidência foi das quedas de mesmo nível (n=185; 57,10%), seguidas dos acidentes de transporte terrestre (n=73; 22,52%). Destaca-se a importância de ações pela equipe multiprofissional de saúde, voltadas à prevenção de acidentes por causas externas na população idosa, com ênfase em informações sobre os riscos e cuidados preventivos nas quedas de mesmo nível em domicílio.

**DESCRIPTORIOS:** Idoso; Causas externas; Acidentes por quedas.

## CARACTERIZACIÓN DE ANCIANOS VÍTIMAS DE ACCIDENTES POR CAUSAS EXTERNAS

**RESUMEN:** Estudio cuantitativo retrospectivo, cuyo objetivo fue caracterizar las ocurrencias en ancianos víctimas de accidentes por causas externas, atendidos por un Servicio de Atendimento Movil de Urgencia, en una ciudad del Estado de Paraná, Brasil. La muestra abarcó 324 ocurrencias en el periodo de junio a diciembre de 2009. Fueron respetados los preceptos éticos en el estudio. La mayoría de las víctimas era del sexo femenino (n=179; 55,25%), en la franja etaria de 60 a 65 años, con Hipertensión Arterial Sistémica (n=80; 24,69%) y Diabetes Mellitus (n=33; 10,18%). Fueron significativas las ocurrencias en los domicilios (n=171; 52,78%); la mayor incidencia fue de las caídas de mismo nivel (n=185; 57,10%), seguidas de los accidentes de transporte terrestre (n=73; 22,52%). Se destaca la importancia de acciones por el equipo multiprofesional de salud, para la prevención de accidentes por causas externas en la población anciana, con énfasis en informaciones sobre los riesgos y cuidados preventivos en las caídas de mismo nivel en domicilio.

**DESCRIPTORIOS:** Anciano; Causas externas; Accidentes por caídas.

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## INTRODUCTION

Accidents due to external causes figure among the main causes of death in the general population and among the elderly. According to data available at the Informatics Department of the Unified Health System, in 2011, external causes were the third cause of death in the general population (N=145,842 deaths) and the seventh cause of death among individuals over 60 years of age (N=24,669 deaths)<sup>(1)</sup>. External causes are considered as injuries, whether physical, mental or psychological, which may or may not lead to death, deriving from accidents (traffic, drowning, poisoning, falls, burns) and violence (aggression/homicide, suicide, physical, sexual and psychological abuse)<sup>(2-4)</sup>.

Accidents and violence represent the main causes of death in the young and adult population but, as age advances, the mortality rates among the elderly have increased. In 2013, mortality due to external causes in the population from the State of Paraná, independently of age, corresponded to 83.7 deaths/100,000 inhabitants. Specifically for the elderly, in Paraná and in the South, respectively, 1,679 and 3,825 died of external causes in the same year<sup>(1)</sup>.

Thus, the occurrence of health problems, characterized by accidents and violence, represents a severe public health problem around the world, with a strong impact on the population's morbidity and mortality<sup>(5)</sup> and the identification of the event profile, as well as the victims' sociodemographic and clinical characterization, permits directing public policies focused on minimizing these events, which can be avoidable. Similarly, care delivery to acute emergency cases should be a source of concern among the health professionals, as lesions that are easily tolerable by young patients can result in considerably mortality rates in the elderly<sup>(6)</sup>.

At emergency services, falls are one of the main care motives. According to the global report of the World Health Organization (WHO), this event corresponds to 40% of injury-related deaths, that is, approximately 28 to 35% of people over 65 years of age are victims of falls each year. This frequency increases with age and with the elderly's frailty level<sup>(7)</sup>. Studies indicate that falls are a cause of death among elderly people, followed by Ground Transportation Accidents

(GTA), drownings and burns, undetermined external causes, aggressions and suicides<sup>(2,4)</sup>. In addition, they demonstrate that these events predominantly happen at home and that alcohol consumption plays a small role<sup>(8-9)</sup>.

This study is justified by the fact that the above described events can cause sequelae in the elderly, such as reduced functional ability, limitation of basic activities of daily living, dependence, depression, reduction of quality of life and even death<sup>(10-11)</sup>. Also, in Brazil, the number of hospitalizations of elderly people due to these causes is relevant, with 413,139 hospitalizations between 2008 and 2010, at an approximate cost of 570 million reais<sup>(12)</sup>.

The objective in this study is to characterize the events in elderly accident victims due to external causes, attended by a Mobile Emergency Care Service, regarding the place and nature, as well as the injuries and signs and symptoms.

## METHOD

A quantitative and retrospective study was undertaken, using secondary data from the event files of a Mobile Emergency Care Service in a city in the State of Paraná-Brazil. The territory of this city is located in the region of Campos Gerais, on an area of 2,025.697 km<sup>2</sup>. In 2009, with an estimated total population of 314,527 inhabitants, 32,320 inhabitants were 60 years of age or older<sup>(13)</sup>.

Nowadays, the structure of the health system in the city consists of 51 Primary Health Care Units, besides 39 family health teams, four health care centers, one Primary Health Care service for the elderly and a general municipal hospital. The emergency care network is being implemented in the city and, in case of this kind of event, the elderly follows the care line applied to all age ranges in this system.

The data collection was undertaken between April and July 2010. The sample included all cases of events with elderly people, that is, 324 victims of external causes (accidents and/or violence), attended in the sample period from June to December 2009. The data were collected by means of an instrument adapted from the service care form, in which the selected variables were: sex, age, morbidities of the victim, place and

nature of the event, lesions, signs and symptoms presented at the moment of the event. After the collection, the data were stored in Microsoft Office Excel 2007® and then submitted to descriptive statistics, demonstrating the results by means of tables with absolute and percentage frequencies.

The study was forwarded to the Research Ethics Committee at the Universidade Estadual de Ponta Grossa and received a favorable opinion under number 18/2010, on April 30th 2010.

## RESULTS

It is indicated in Table 1 that, among 324 cases of care to elderly accident victims due to external causes, 55.25% (N=179) of the elderly were female, between 60 and 65 years of age (N=85; 26.24%), followed by 80 years or older (N=80; 24.69%). The morbidities were Systemic Arterial Hypertension (N=80; 24,69%) and Diabetes Mellitus (N=33; 10.18%).

As regards the event site, the home was predominant (N=171; 52.78%), as well as public roads (N=135; 41.67%). Falls from the same height were the most frequent (N=185; 57.10%); followed by ground transportation accidents (N=73; 22.52%). Falls from heights corresponded to 10.8% (N=35) of the events (Table 2).

Board 1 shows that the main injuries were bruises (N=158), abrasions (N=102), blunt wounds (N=95) and fractures (N=63). The most affected body regions were the lower limbs (N=127), upper limbs (N=107) and skull (N=105).

Pain is highlighted as the main symptom the elderly presented (N=159; 49.07%); and all of them experienced more than one sign or symptom during care (Table 3). The data on signs and symptoms had not been fully completed on the event forms though.

As regards the victims' forwarding, the municipal public hospital received N=229 (70.68%) elderly, as that is the referral institution for care in the city, and only N=95 (29.32%) were forwarded to other services.

Table 1 – Distribution of elderly accident victims due to external causes attended by a mobile emergency care service according to sex, age and morbidities. Ponta Grossa-PR-Brazil, 2010

<b>Sex</b>	<b>n</b>	<b>%</b>
Female	179	55,25
Male	145	44,75
<b>Age</b>	<b>n</b>	<b>%</b>
60 -  65 years	85	26,24
65 -  70 years	50	15,43
70 -  75 years	65	20,06
75 -  80 years	44	13,58
> 80 years	80	24,69
<b>Morbidities</b>	<b>n</b>	<b>%</b>
Systemic Arterial Hypertension	80	24,69
Diabetes Mellitus	33	10,18
Cardiovascular Disease	16	4,94
Cerebrovascular accident	08	2,47
Respiratory Disease	06	1,85
Convulsion	05	1,54
Alcoholism	04	1,23
Mental Illness	03	0,92
Renal Illness	02	0,62
AIDS	01	0,30
Others	49	15,12
Not Informed	123	37,92

Obs.: The total number of clinical antecedents exceeded 100% as there was more than one antecedent per individual.

Table 2 – Distribution of place and type of events involving elderly accident victims due to external causes attended by a mobile emergency care service. Ponta Grossa-PR-Brazil, 2010

<b>Event site</b>	<b>n</b>	<b>%</b>
Home	171	52,78
Public road	135	41,67
Commercial establishment	05	1,54
Workplace	01	0,31
Others	12	3,70
<b>Event type</b>	<b>n</b>	<b>%</b>
Fall from same height	185	57,10
Ground transportation accident	73	22,52
Fall from height	35	10,8
Violence	10	3,10
Accident involving animal	04	1,23
Burn	03	0,93
Knife wound	02	0,62
Others	12	3,7

Board 1 – Distribution of injuries identified in elderly accident victims due to external causes attended by a mobile emergency care service per body region. Ponta Grossa-PR-Brazil, 2010

<b>Injury types</b>	<b>Skull</b>	<b>Face/ Neck</b>	<b>Back</b>	<b>Chest/ Abdomem</b>	<b>Pelvis</b>	<b>Upper limbs</b>	<b>Lower Limbs</b>	<b>Total</b>
Bruises	32	23	11	22	12	22	36	158
Abrasions	17	12	03	03	-	43	24	102
Blunt wounds	52	28	-	-	-	06	09	95
Fractures	-	05	-	05	01	13	39	63
Dislocations	01	-	-	-	02	08	10	21
Lacerations	03	04	-	-	-	10	01	18
Exposed fractures	-	-	-	-	-	02	06	08
Piercing wounds	-	01	-	02	-	01	01	05
Burns	-	03	-	-	-	01	01	05
Amputations	-	-	-	-	-	01	-	01
<b>Total</b>	<b>105</b>	<b>76</b>	<b>14</b>	<b>32</b>	<b>15</b>	<b>107</b>	<b>127</b>	<b>476</b>

Obs.: The total was higher than the sample due to the occurrence of more than one injury per individual and in different body regions.

Table 3 – Distribution of the signs and symptoms presented by elderly victims of accidents due to external causes attended by a Mobile Emergency Care Service. Ponta Grossa-PR-Brazil, 2010

Signs and symptoms	n	%
Pain	159	49,07
Bleeding	19	5,86
Paleness	8	2,47
Vomiting/nausea	8	2,47
Agitation	7	2,16
Unconsciousness	5	1,54
Convulsion	4	1,23
Absence of pulse	1	0,31
Cyanosis	1	0,31
Others	50	15,43

## DISCUSSION

The accidents due to external causes reveal a predominance of the female gender and, out of 324 care services provided, more than half derived from events at the patients' homes (52.78%), which can be justified by the women's (retired women or housewives) domestic activities in this phase of life. Other factors that need to be considered are the architectonic barriers of the environment and the multiple drugs predominant among women, especially psychotropic drugs, which can increase the risk of falls<sup>(14)</sup>. Brazilian<sup>(2,9)</sup> and international studies<sup>(15-16)</sup> on the theme found similar results.

The incidence of the events was bigger in the age range from 60 to 65 years. Studies<sup>(17-19)</sup> affirm that the majority of this age group displays independence and autonomy, as well as work, leisure and social activities. These are characteristics of an adult population that increase their exposure to accident risks due to external causes.

The number of events among elderly over 80 years of age was also significant. In a study<sup>(19)</sup> developed in Londrina-PR, Brazil, involving 108 elderly trauma victims attended at an emergency service, 33% belonged to this age range. As age advances, anatomic and physiological changes deriving from the aging process can compromise the elderly's functional performance and make them more susceptible to accidents due to external causes.

The occurrence of Systemic Arterial Hypertension (SAH) and Diabetes Mellitus (DM) is observed. This situation is expected as the incidence of these diseases is considered

significant in the elderly. In Brazil, the frequency of the previous medical diagnosis of SAH and DM corresponded to 59.7% and 21.6%, respectively, in individuals aged 65 years or older in 2009<sup>(10)</sup>. This finding is similar to other studies in which a high incidence of comorbidities was found among elderly accident victims of external causes<sup>(6,9,19)</sup>.

The presence of chronic diseases and comorbidities, associated with a dynamic profile of contemporary elderly, permits the occurrence of falls, resulting in significant psychological, physical and social consequences for the lives of these individuals.

As regards the nature of the call, falls from the same height represented more than half of the events (57.10%). The literature indicates similar data in Brazilian studies<sup>(9,11)</sup> and attribute a number of causes to the accidents: loss of consciousness, slides or stumblings in smooth or wet surfaces. It is highlighted that these accidents could be mitigated or avoided through falls prevention programs and measures.

Falls are considered a complex phenomenon, influenced by different aspects intrinsic and extrinsic to the individual and which, in most events, result in different lesions<sup>(4,20)</sup>, can cause abrasions, different fractures, cranial traumas and even death of the elderly. They appear as responsible for the largest proportion of deaths, hospitalizations and emergency care<sup>(7)</sup>.

In the Gerontology area, professional care strategies to prevent falls in the elderly are fundamental. These care orientations are put in practice through awareness raising actions of the elderly and their relatives, which involve

information about risks and care, and these require behavioral changes (lifestyle) and environmental modifications (architectonic barriers). This is only feasible through the health professionals' training with regard to falls prevention and management.

WHO's theoretical falls prevention model<sup>(2)</sup> can be used, as an articulated, systematic and comprehensive strategy; its objective is to raise awareness about the importance of the prevention and treatment of injuries due to falls, as well as to improve the assessment of the different causal factors and the implementation of interventions that can reduce their occurrence in the elderly.

A large number of GTA events was found. International studies indicate the significant increase in this event, as well as the high mortality rates in individuals over 60 years of age<sup>(21-23)</sup>. In general, this age group is more frequently involved in run overs, with multiple injuries that cause death<sup>(19)</sup>.

Falls and ground transportation accidents can be more frequent among the elderly due to the physiological changes deriving from the aging process itself, such as a reduction of the walking speed, visual and hearing acuity deficit, physical and cognitive alterations deriving from diseases and inappropriate domestic environments in the elderly's place of residence.

It is highlighted that the number of violence-related events among the elderly was not significant, which can be justified by the frequent underreporting of these events to the health services. Thus, complications deriving from accidents and violence, such as death, tend to be characterized as a complication deriving from trauma<sup>(24-25)</sup>. According to WHO, although not a recent phenomenon, the extent of violence against the elderly is not very known yet<sup>(7)</sup>.

As regards the distribution of injuries identified in the elderly, the predominance of bruises, abrasions, blunt wounds and fractures is observed. In a study undertaken in the city of Campinas, cranial traumas and face injuries are common events in elderly trauma victims<sup>(6)</sup>.

Specific fracture injuries were found in only 19.44% of the elderly, differently from international studies, which indicate that this has been one of the most significant consequences in terms of external causes, especially falls<sup>(16,26)</sup>. It is highlighted that bruises and mainly fractures

can cause immobility in the elderly, interfering in the accomplishment of the basic activities of daily living, and can lead to a situation of dependence and loss of autonomy.

As regards the signs and symptoms registered, pain stands out among other clinical manifestations. This finding supports the results of the study developed at an emergency sector, in which about 80% of the patients admitted indicated pain, particularly after trauma events<sup>(19)</sup>.

As highlighted, the limitations in this research derive from its documentary nature, which can compromise the reality of the research phenomenon, as the morbidity variable may have been underreported. Also, the information quality, such as the use of illegible handwriting in the care forms; incomplete data, among others, hampered the collection of information for the study.

## CONCLUSION

The accident events in elderly victims of external causes showed the predominance of women in the age range between 60 and 65 years, suffering from hypertension, who were victims of accidents at their home, mainly falls from the same height, causing lesions like bruises and abrasions.

Besides the physical consequences, in general, the psychological and social effects deriving from accidents due to external causes are not considered in emergency care. It is highlighted that, in elderly patients, these outcomes are relevant and can entail short and long-term consequences, with the ability to evolve to death.

In conclusion, the characterization of elderly accident victims due to external causes contributes to reflections on this phenomenon, which represents a public health problem, favoring the elaboration of educational and prevention activities for this age group.

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