Falls in Elderly: Study of the Prevalence and Associated Factors

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ABSTRACT

Institutionalized elderly presents a higher risk of falling than those who are not. The issue of falls among elderly people should be considered as a serious public health problem because of its consequences and permanent costs. Objective: This study will intend to assess the risks and the determinative factors of falls among institutionalized elderly. Methods: A non-experimental, cross-sectional, descriptive-correlational and quantitative study. We used a non-probability convenience sampling composed of 136 elderly people who were institutionalized at the time. They were between 65 and 99 years old, with an 85.98 years old average age. To collect the data, we used a protocol formed by questions about these people’s socio-demographic, contextual and clinical characterization. We also used the Family Functionality Scale, the Self-care Dependency Evaluation Scale and the Tinetti Scale (POMA I). Results: Most of the people from our sample show a high risk of suffering from falls: we have concluded that about 45.6% of elderly people present a high risk of falling, 16.5 % a medium risk and 38.2% a low risk of suffering from this kind of accident. We also observed that the risk of falling was higher among elderly who showed the following characteristics: in females (p=0,014), in those who show a poor literacy (p=0,000), in those who exhibit any kind of cognitive impairment (p=0,014), in people who suffer from neurological and osteoarticular diseases (p=0,000) and in elderly who suffer from loss of visual and hearing acuity (p=0,010). By contrast, the elderly who experience a better autonomy as far as their walking capacity, personal hygiene and medication are concerned are those who show a lower risk of fall accidents. Conclusions: Falls in institutionalized elderly are becoming a serious problem in the elderly, requiring health professionals to effectively intervene in their prevention.

Keywords: Balance, Elderly, Functional Ability, Risk of Falls

I. INTRODUCTION

Demographic ageing is one of the most important phenomena of the twenty-first century, especially in the so-called developed societies because of the personal, social, family, and economical implications it can trigger (Martins & Santos 2020). Societies have been trying to progressively adjust themselves to a new paradigm, by turning what was, in the past, considered as a fatality into an opportunity to live an active aging process during which the elderly person’s participation and independence will be promoted (Ribeiro & Paul, 2018).

The concept of “elderly”, of “old age” varies according to the dimensions we take into account: biologically, ageing is a process which begins right after birth; socially, it varies according to the historical and cultural moment; intellectually, the individual grows older when his or her cognitive faculties start to fail him or her, leading to memory, focus, orientation and concentration problems.

Economically, ageing happens when a person retires from work and is no longer a productive member of society. Finally, we must stress the importance with which we must look at functional ageing. It occurs when the individual loses his independence and needs support to perform his daily life tasks (Fermento et al., 2019).

Within the European Union, Portugal is below the average rate when it comes to the proportion of young people and above the average rate when it comes to elderly people, being therefore among the EU countries which exhibit an older population.
In 2013, the ageing index in Portugal was 136 elderly people per 100 young people. Alentejo was the Portuguese region where the population was the oldest and the Autonomous Region of the Azores was the Portuguese region where there was a higher rate of young people (INE, 2018).

In the central region of Portugal (the geographic area where this study was conducted) about 23% of the population are 65 years old or above, in contrast 14 year old youngsters represent only 13% of the total population (INE, 2018). This phenomenon of demographic ageing of the population, associated with the changes that have occurred in recent years within family dynamics, leads to an increasing search for institutions that can take care of elderly people and that will help solve some of the problems and needs families have to currently face.

There are many factors that will make an elderly turn to institutionalization, but all are associated with: the lack of family support, the lack of decent housing, the lack of financial resources and self-care dependence (Carvalho & Dias, 2016). These diverse dependencies associated with countless physical and neurological changes turn the elderly into someone who is much more vulnerable to accidents, namely, to falls. The main cause for home accidents injuries are falls. This prevalence increases as people grow older and, in people who are 75 years old or older, may represent 90% of the registered incidents (Contreiras et al., 2011).

Institutionalized elderly presents a higher risk of falls when compared to those who live in the community and according to WHO (2017), 30-50% of the senior people who are institutionalized suffer from falls every year and 40% of these people suffer from recurring falls. These falls are caused by a complex interaction between several factors that can be classified as being part of different dimensions: biological, behavioural, environmental, and socio-economic.

As for the biological dimension, there are factors which are considered as non-modifiable (age, gender and race) and those that are modificable (chronic diseases, decrease in a person’s physical, affective and cognitive abilities). The behavioural dimension has to do with human actions or, in other words, with emotions and with the choices that everyone makes in their everyday life: choosing a sedentary lifestyle, alcohol abuse, among others. The environmental dimension involves all the aspects that are part of the environment in which the individual dwells: the buildings’ design and adjustment, slippery floors, uneven floors or with holes, insufficient lighting, among others. Finally, the socio-economic dimension involves all the factors that can be changed by society: a person’s educational level, the habitability conditions, the level of access to healthcare, among others (WHO, 2017). In fact, in a time where more and more people talk about the economic impact that diseases and other events can cause, falls must be regarded as an important cost as far as medical services are concerned. Those costs may be direct costs, like the hospital bills, the medical appointments, rehabilitation sessions, diagnostic complementary exams, medication, among others, or indirect, like the individual’s morbidity or death (Lord et al., 2007).

The consequences of falls are countless; however, most of them contribute to an increase in the elderly person’s functional dependence. That is why research conducted about falls among institutionalized elderly, are a valuable way to understand this phenomenon in its different dimensions and are undeniably an added value that will help in the reformulation of the clinical healthcare practice, especially as far as the competences of rehabilitation specialist nurses are concerned.

II. METHODOLOGY

We developed a non-experimental, cross-sectional, quantitative, and descriptive-correlational study which main objective was to identify the risk of falls among institutionalized elderly people and to verify to what extent socio-demographic, clinical and psychosocial variables are associated with this kind of risk.

We selected a non-probability convenience sampling composed of 136 institutionalized elderly from the Viseu geographic area. The participants’ eligibility depended on the following inclusion criteria: they had to be 65 or older, to be institutionalized and to show a cognitive ability that would enable them to cooperate in the study (assessed through the Mini Mental State Examination).

The data collection took place between February and May 2018 and the data collection instrument we used was composed of four sections: the first focused on the participants’ socio-demographic characterization; the second on their clinical characterization; the third on their family characterization (Family Functionality Scale) and on the evaluation of their dependence regarding self-care (Self-care Dependency Evaluation Scale) and, finally, the fourth section focused on the participants’ falls record and on the evaluation of the risk of falls through Tinetti Index.

All the procedures were conducted according to a strict ethical conduct (with the prior consent of the management boards of the institutions and their Ethical Committees and the anonymity and confidentiality of the data collected were guaranteed.

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Statistical treatment was processed using the 23.0 version for Windows and Microsoft Word of the SPSS (Statistical Package for the Social Science) programme and we used descriptive and inferential statistics.

III. RESULTS

The elderly who composed our sample were between 65 and 99 years old, with an average age of 85.98 years old. Most of them were female (76.6%) and widows/widowers (60.7%). Their educational level was generally low (73.4% attended primary school or had completed basic education only). Despite being institutionalized, most of the elderly (56.4%) confess being part of highly functional families.

As far as the participants’ clinical situation was concerned, we could observe that the pathologies which had a higher prevalence among them were cardiac (70.6%), osteoarticular (62.5%) and neurological (55.1%) diseases. We found out that there were elderly patients who were polymedicated and the pharmacologic groups which had a higher relevance for this study were hypertensive medicine (57.4%), tranquillizers (54.6%) diuretics (51.5%).

78.5% of the patients exhibited a decrease in their hearing acuity, 62.2% exhibited a decrease in their visual capacity and 54.2% told us they were suffering from mobility problems. However, only 52.6% of them confessed they were feeling pain and merely 33.3% assumed they had participated in structured rehabilitation programmes.

Falls are a reality in these institutionalized elderly people’s lives, since 27.2% of them reported having gone through such a situation in the last twelve months of their institutionalization. Most of the falls occur during the day (81.1%), and they mostly occur in the elderly patients’ bedrooms (46%). The most common cause of falls in the elderly is “slipping” (62.2%) and the consequences resulting from this sort of accidents force 75.7% of the elderly to seek the help of healthcare services.

As far as the risk of falls is concerned (and according to the analysis of table I), we confirmed that 45.6% of our participants exhibit a high risk of fall incidents, 38.2% of them a low risk of suffering from falls and 16.2% a medium risk. The comparative study conducted between male and female situations indicates that female exhibit a higher risk of suffering from this kind of accident (51.0%), while male participants show a lower risk (53.0%). However, the statistical differences are not significant ($\chi^2=5.227; p=.073$).

| TABLE I: RISK OF FALL INCIDENTS (IN GROUPS) ACCORDING TO GENDER |
|-----------------|--------|--------|--------|--------|--------|
| Gender          | Male   | %      | Female | %      | Total  | %      |
|                 | N      | (M)    | N      | (M)    | N      | (M)    |
| High            | 10     | 29.4   | 52     | 51.0   | 62     | 45.6   |
| Medium          | 6      | 17.6   | 16     | 15.7   | 22     | 16.2   |
| Low             | 18     | 53.0   | 34     | 33.3   | 52     | 38.2   |
| Chi-Square Test |        |        |        |        | $\chi^2=5.227; p=0.073$ |

The study’s inferential analysis about the correlations that exist between the variables showed that the patients who exhibited a higher risk of fall incidents were the female participants ($p=0.014$), those who had lower academic qualifications (primary education, $p=0.000$), those who were suffering from neurological and osteoarticular diseases ($p=0.000$) and those whose daily medication included benzodiazepines, neuroleptics, diuretics, and oral antidiabetic drugs ($p=0.012$).

In parallel, the elderly who exhibit a loss in their visual and hearing acuity ($p=0.010$), those who were undergoing oxygen therapy ($p=0.010$), who had never attended a rehabilitation programme ($p=0.039$) and who exhibit a lower autonomy in self-care, namely in situations that had to do with taking their baths, taking their medicine and walking, were those who exhibit a higher risk of suffering from falls incidents.

By contrast, age, civil status, the perception revealed about family functionality and the pain experienced do not show any significant correlation ($p=0.05$) with these elderly patients’ risk of falls.

IV. DISCUSSION

Although our intention is not to look at ageing as if it were a problematic step in a person’s life, we know that this natural phenomenon is associated with several structural and functional changes that can cause an increase in fall incidents. Therefore, this kind of incidents shouldn’t be viewed as an isolated issue, but falls should actually be considered a frailty factor, since the elderly who exhibit a higher risk of suffering from fall incidents also exhibit a higher functional inability, are institutionalized and seek the help of healthcare services much more frequently.

Our results show a high risk of falls prevalence in elderly people who are institutionalized, since 45.6% of our sample exhibit a high risk of fall incidents, 16.2% a medium risk and only 38.2% of the participants show a low risk of suffering from this kind of incident. Those data support the opinion of Fermento et al.,
(2019) when he refers that most of the elderly (66.7%) who participated in his study exhibited a high risk of fall incidents, although they manifested distinct levels of frailty.

Knowing about when and where the falls have taken place and the circumstances in which they had happened is essential because it is the only way people have to develop the appropriate strategies that will prevent them from happening. According to our study, most of the falls happen during the day (81.1%). This fact is supported by the studies conducted by Ferreira and Yoshitome (2016) who observe that falls happen mostly during this period of time because it represents the time window in which the elderly people’s movements are more significant. The place where falls incidents have more frequently occurred was the patients’ bedrooms (46%). This discovery should represent a warning: we have to make those places safer and highly monitored by healthcare teams. Gomes et al., (2013), Almeida and Neves, (2013) tell us that the bedrooms and the bathrooms are places with a high incidence of fall incidents.

While looking into the motives that explained the fall incident, we realized that “slipping” was responsible for 62.2% of the cases, “tripping” was responsible for 24.3% of the accidents and 10.8% of the fall incidents had been caused by “dizziness”.

Those results also support those presented by Santos (2017), who observed that the most common cause of falls among the elderly was “slipping and tripping”. These data warn us about how important it is to implement slip-resistant flooring surfaces in residences, to develop informative sessions for the elderly and their family members about home accidents, the use of appropriate mobility aid equipment, the use of slip-resistant shoes, warning wet floor and slippery floor signs and the need to assist the elderly whenever they have to walk. Nowadays, there is an increasing focus on the economic repercussions associated with different kinds of incidents and that is why the consequences of these falls’ incidents are seen as a serious problem, not only because of the economic costs that come from the healthcare treatments these people will have to receive, but also because of the negative effects these accidents will have on the elderly quality of life and autonomy. As a matter of fact, most of our elderly participants had to face different types of consequences as a result of the falls they had experienced, consequences that range from simple bruises and scratches (18.9%), ecchymoses (32.5%), to bone fractures (21.6%).

We have to stress out that 70.3% of the participants had to seek help from healthcare services. Almeida and Neves, (2013), too, referred the patients’ bruises and scratches and other more serious situations that needed medical assistance (54%) as the main consequences of these incidents. Falls among the elderly are actually multi-factorial and involve intrinsic and extrinsic conditions: we concluded that women exhibited a higher risk of falls than men, a fact that was in agreement with the research conducted by Almeida and Neves, (2013). Barbosa and Oliveira, (2012) and Teixeira et al., (2014), since we have to take into account women’s longer lifespan and the fact that they are prone to suffer from osteoarticular diseases like osteoporosis that will increase the risk of falls incidents.

The participants’ academic qualifications seemed to be associated with the risk of falls, but negatively. In other words, the elderly who have higher school qualifications exhibit a lower risk of falls and vice versa.

Elderly people’s clinical background has been considered in many studies as key factors for falls: the elderly who participated in our study and who had suffered from neurological and osteoarticular diseases exhibit a higher risk of falls incidents, too. These data strengthen what have been described in literature: Parkinson’s disease, Myopathies and peripheral neuropathies, cervical spondylosis and dementia are diseases which are closely related to the increase in the risk of falls (Freitas & Py, 2011).

Neurological and osteoarticular pathologies are often related to the decrease in people’s balance and the strength they feel in their lower limbs, situations that will increase the risk of fall incidents. The knowledge we have of these people’s clinical background is indeed a most valuable instrument for the healthcare workers that will allow a decisive course of action for certain groups of elderly. The development of rehabilitation programmes in order to improve the patients’ balance and strengthen their lower limbs seems to be an effective measure to prevent fall incidents.

We could observe that the kind of medicine that was given to the elderly had an influence on the risk of falls: we concluded that the elderly who were given antihypertensive drugs (57.4%), tranquilizers (54.6%) and diuretic drugs (51.5%) exhibited a higher risk. This relationship has been widely discussed and many have focused on the effects of psychotropic substances (neuroleptics and benzodiazepines), cardiovascular medication, corticosteroids and nonsteroidal anti-inflammatory drugs (Freitas & Py, 2011). Lord et al., (2007) adds to this list the antidepressants, the antiarrhythmic drugs (digoxin) and diuretic drugs.

There is indeed an evolving need to revise the list of medication prescribed to elderly patients on a regular basis. This regular checking will prevent cases of polymedication among these patients and all the negative consequences that are related to such a situation. In this particular context, healthcare professionals who work in institutions for the elderly play a crucial and binding role in helping prevent such occurrence.

In parallel with the factors we have just described the decrease in the elderly visual and hearing acuity increases the possibility of fall incidents. These results are in agreement with those presented by Gomes et al., (2013) and Gonçalves et al., (2014) when they stated that physiological changes, namely the loss of visual capacity, can cause loss of balance and therefore increase the risk of fall incidents. Once again, the
existence of hearing and visual screenings, as well as the inspection of the integrity and appropriate functioning of compensatory instruments (glasses, hearing aids, among others), become an essential measure among the elderly. As far as pain is concerned, it is surprising to realize that the elderly who have experienced pain more often are those who exhibit a lower risk of falls, however differences were not significant. We think that the additional precautions taken by the participants in order to fight pain may indirectly become a preventive measure against fall incidents. However, these results contradict those presented by Peres (2014), who didn’t find any significant differences between the perception of pain and the risk of falls.

Finally, we confirmed that the elderly who show a greater autonomy in self-care (walking, bathing, and taking their medication without anyone’s help) show a lower risk of suffering from falls. On the other hand, those who experience a greater dependence (a dependence which includes the use of wheelchairs, for instance) are also people who exhibit a low risk. These data are similar to those published by Paraíso (2014), Almeida (2012) and Santos (2012), when they declared that the dependence caused by the loss of people’s functional ability must be considered as a risk factor for fall incidents, since the elderly who show a greater independence are those who experience less falls. The dependence we referred before will also increase the need to seek other people’s help to be able to carry out their daily life activities. As a matter of fact, mild or light dependence have been considered as risk factors for fall incidents, however the elderly who experience this kind of dependence are less prone to fall accidents than those who show a greater independence (Santos, 2012 and Almeida, 2012).

It is important to point out that promoting the elderly person’s autonomy in situations that involve different self-care routines is essential. The practice that elderly people have to follow must be encouraged by qualified professionals who got the specific and appropriate training. Among those professionals we have to include rehabilitation nurses. As far as we are concerned, Rehabilitation Nursing plays a truly vital role in preventing fall incidents and this role is even more important when we deal with institutionalized elderly.

V. CONCLUSION

The main conclusion of our study strengthens the paradigm that the risk of falls among institutionalized elderly is really significant, since 45.6% of them experience a high risk of falls, 38.2% a low risk and 16.2% a medium risk of suffering from this kind of accidents. We also observed, in agreement with what WHO (2007) described, that falls are usually caused by the interaction between different factors that are classified into several dimensions: biological, behavioural, environmental, and socio-economic.

In the biological dimension, we found a higher risk among women, among the elderly who were suffering from chronic neurological and osteoarticular diseases, who have been experiencing visual, hearing, cognitive and mobility restrictions and who were taking benzodiazepines, neuroleptic and diuretic drugs and oral antidiabetics.

In the behavioural dimension, we didn’t find any statistically significant correlation, however most participants experience a sedentary lifestyle and the shoes and clothing that the elderly was wearing weren’t always the most suitable for them, given their situation. In the environmental dimension, we observed that most of the falls happened in the elderly patients’ bedroom (the elderly person’s closest surrounding area) and that they were caused by tripping or slipping incidents (because of imbalance, postural alterations and decreased sensory perception). In parallel, the buildings’ design, slippery floors, uneven floor surfaces and the inability to adapt to a new home environment are also factors that will increase the risk of falls.

Finally, in the socio-economic dimension, we confirmed that the risk of falls was higher among the elderly who had lower academic qualifications (primary school), in those who had never attended any rehabilitation programmes, in those who exhibited a lower autonomy in self-care, namely when they had to bath, walk, and take their medication.

In conclusion, the results revealed in this study show the need felt by healthcare professionals, and rehabilitation nurses especially, to implement structured interventions in order to multiply educational sessions in which the elderly people and caretakers will receive information about falls, risk factors and prevention measures, about the patients’ medication update, about how to assess the patients’ walking capacity, about simple balance, about muscular strength and how to carry out individual exercises that will help promote the elderly people’s health.
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CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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