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## ORIGINAL ARTICLE

### ENVIRONMENTAL FACTORS FROM THE INTERNATIONAL CLASSIFICATION OF FUNCTIONALITY THAT INFLUENCE IN FALLS OF DOMICILED ELDERLY FATORES AMBIENTAIS DA CLASSIFICAÇÃO INTERNACIONAL DE FUNCIONALIDADE QUE INFLUENCIAM EM QUEDAS DE IDOSOS DOMICILIADOS FACTORES AMBIENTALES DE LA CLASIFICACIÓN INTERNACIONAL DE FUNCIONAMIENTO QUE INFLUYEN EN CAÍDAS DE LAS PERSONAS MAYORES EN EL DOMICILIO

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#### ABSTRACT

**Objective:** to relate the environmental factors of the International Classification of Functioning, Disability and Health with falls occurring in elderly domiciled in a city of Rio Grande do Sul, Brazil. **Method:** cross-sectional epidemiological research with 167 elderly, held from June to July 2013 whose data was collected through the application of an instrument which contained the environmental factors of the Classification. The data results were grouped into a database for descriptive/ statistic treatments. This project was approved by the Ethics Committee for Research under protocol n°88/2013. **Results:** the use of acetylsalicylic, diclofenac and paracetamol presented association to the falls. Younger seniors who used more diclofenac had higher number of changed environmental factors, specifically as for their food and clothing habits, as compared to the ones with 80 years old or more. The elders with 80 years old and above use more acetylsalicylic and paracetamol and have a higher prevalence of falls. **Conclusion:** the nurses who are inserted in different contexts can make use of these results in the intervention and strengthening actions in the search for fall prevention. **Descriptors:** Elderly; Accidental Falls; International Classification of Functioning, Disability and Health; Environment; Nursing.

#### RESUMO

**Objetivo:** relacionar os fatores ambientais da Classificação Internacional de Funcionalidade, Incapacidade e Saúde com quedas ocorridas em idosos domiciliados em uma cidade do Rio Grande do Sul, Brasil. **Método:** pesquisa epidemiológica transversal com 167 idosos, realizada de junho a julho 2013, cuja coleta de dados ocorreu por meio da aplicação de instrumento contendo os fatores ambientais da Classificação, sendo agrupados em um banco de dados para tratamento estatístico/descriptivo. O projeto de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa, protocolo n° 88/2013. **Resultados:** o uso de acetilsalicílico, diclofenaco e paracetamol apresentaram associação com quedas. Os idosos mais jovens que utilizaram mais diclofenaco tiveram maior número de fatores ambientais alterados, especificamente em relação aos alimentos e vestimenta, quando comparados com os de 80 anos ou mais. Os idosos com 80 anos e mais, utilizam mais acetilsalicílicos e paracetamol e tem maior prevalência de quedas. **Conclusão:** os enfermeiros inseridos em diferentes contextos poderão fazer uso destes resultados na intervenção e fortalecimento de ações na busca pela prevenção de quedas. **Descritores:** Idoso; Acidentes por Quedas; Classificação Internacional de Funcionalidade, Incapacidade e Saúde; Meio ambiente; Enfermagem.

#### RESUMEN

**Objetivo:** relacionar los factores ambientales de la Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud con las caídas que ocurren en personas de edad domiciliado en la ciudad de Río Grande do Sul, Brasil. **Método:** investigación epidemiológico transversal con 167 adultos mayores, que tuvo lugar del 06 hasta 07, 2013 cuyos datos fueron recolectados a través del instrumento de aplicación de los factores ambientales de la Clasificación, que se agrupan en una base de datos para el tratamiento estadístico / descriptivo. El proyecto de investigación fue aprobado por el Comité de Ética de la Investigación, el protocolo n° 88/2013. **Resultados:** el uso de acetilsalicílico, diclofenaco y paracetamol se asociaron con las caídas. Las personas mayores más jóvenes que utilizan más diclofenaco tuvieron un mayor número de factores ambientales alteradas, específicamente en relación con los alimentos y la ropa, en comparación con 80 años o más. Los de 80 años y más, utilizar más y paracetamol y acetilsalicílico tienen una mayor prevalencia de caídas. **Conclusión:** las enfermeras insertados en diferentes contextos pueden hacer uso de estos resultados en la intervención y el fortalecimiento de las acciones en la búsqueda de la prevención de caídas. **Descriptores:** Ancianos; Caídas accidentales; Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud; Medio Ambiente; Enfermería.

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## INTRODUCTION

Brazil is in a significant demographic transition, as for the aging of the population, with considerable quantitative growth of the elderly. Given this context, geronto-geriatric studies describe this as a complex reality that comes accompanied by changes in different national spheres.<sup>1</sup>

The fall can be considered a type of unintended and unexpected domestic accident, in which the body of the individual goes to a lower level compared to its original position, at a speed in which its prevention and correction aren't possible, driven by intrinsic (inherent to the elderly themselves) and extrinsic (related to the environment). It is the second cause of death by accidental and non-accidental injuries.<sup>2</sup>

Among the issues that affect the health of older people, the falls can be cited, with economic consequences for the elderly, family, public and private health system managers, increasing the costs with health care and social support in order to meet the needs of those elderly people. These accidents can cause light injuries or complex fractures, which can lead the elderly to live a long and difficult rehabilitation, specially psychologically. Another consequence of the fall is the post-fall syndrome, which creates uncertainty and fear, and anxiety over the possibility of further accidents.<sup>3</sup>

The fall is an event resulting from the change of the individual's position to a lower level in relation to its initial position, at a speed in which its prevention and correction aren't possible nor the use of support on ground.<sup>4</sup>

Falls lead to many impacts on the life of an elderly person and may include morbidity, decreases in mobility and functionality, decreases in daily activities, increased susceptibility to disease, hospitalization, institutionalization, use of social and health services and mortality.<sup>5</sup>

The causal factors for falls are known as intrinsic and extrinsic. The intrinsic are related to the person, such as impaired mobility and balance, sedentary lifestyle, *cognitive* impairment among others. The extrinsic are associated with external, environmental/contextual features such as environmental conditions: Slippery and uneven surfaces, wet soils, inadequate clothing and shoes, among others<sup>6</sup>

In addition to the intrinsic and extrinsic factors, falls also occur as a result of a complex interaction of other factors, which reflect the diversity of health determinants

that directly or indirectly affect the wellbeing of the elderly and are presented in organic dimensions (age, gender and race, chronic non-communicable diseases); Behavioral (use of multiple drugs, excessive alcohol consumption, physical inactivity, inappropriate shoes); Environmental (inappropriate *design* of buildings, loose rugs, slippery floors, broken or uneven sidewalks, poor lighting, Social and Environmental (low income, low education, inadequate housing, lack of social interaction, limited access to health care and social care in remote areas and lack of community resources).<sup>7</sup>

Environmental risks are the ones that cause falls in older people. As for the place of occurrence of falls, it was found that the majority of falls among elderly occur in their own homes, indicating that those events that can be reduced with the implementation of programs and preventive actions.<sup>8</sup>

Thus, it is essential to know the risk factors that can lead to falls in elderly people, as well as the possible needs in health care to ensure the citizens rights to the implementation of actions that provide more assertive practices in the care.

The maintenance of the functional capacity of the elderly is an important tool for measuring the gerontological practice as well as it's an essential care to prevent the functional decline that can be influenced by risk factors such as the aging process, sex, low education, marital status and low income.<sup>9</sup>

Thus, the nurse plays an important role in identifying and understanding the socioeconomic characteristics, clinical profile, previous diseases, co-morbidities, use of medications, lifestyle, leisure activities, factors that may or may not interfere with the functional capacity. This knowledge assists in performing better care and contributes at all levels of prevention.<sup>10</sup> To evaluate the elderly, some scales, test and rating can be used.

The WHO published in 1976, the International classification of impairment, disabilities and handicaps (ICIDH). This model contained the linear sequence disease-impairment-disability-handicap. Its revisions showed it had conceptual weaknesses such as lack of relationship between the dimensions approached and the lack of approach on social and environmental aspects. In May 2001, after the review of the publication, the World Health Assembly adopted the International Classification of Functioning, Disability and Health (ICFDH).<sup>11</sup>

The ICFDH is a classification with multiple purposes, designed to meet different sectors

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and aims at establishing a common language for describing health and health conditions, improving communication among users.<sup>12</sup> Based on a biopsychosocial approach, it incorporates health in physical and social levels, making clearer the perception that the same diagnosis can have different functional limitations.<sup>11-13</sup>

Regarding the nurses in the care of elderly people when in their different work contexts, it is urgent to invest in training so that actions led by the ICFDH can be approached, in aspects such as functionality, autonomy and prevention of injuries. With the ICFDH, nurses can assess the elderlies individually, identifying their basic needs that have been affected and developing / programming the care plan, in order to maintain active aging.<sup>12</sup>

Given the above, the leading question for this research is brought up: what is the relation between the environmental factors from ICFDH and falls in elderly domiciled in a city of Rio Grande do Sul / Brazil? And therefore the objective of this study is built: to relate the environmental factors at International classification of functioning, disability and health with falls occurred in elderly resident of a city of Rio Grande do Sul, Brazil.

METHODOLOGY

The present article has been developed from the Doctoral Thesis in Nursing: Associated factors and predictors of falls in elderly domiciled according to the International Classification of Functioning, Disability and Health presented. The Thesis was presented to the Post-Graduation Program in Nursing at the Federal University of Rio Grande (FURG ), RS, Brazil in 2014.

It is an epidemiological study<sup>14</sup> conducted from June to July 2013, adopting the field of study the registered nursing homes in a Basic Unit of UAA of Rio Grande do Sul, Brazil. The study subjects were 167 elderly from the neighborhood around the UBS. The following criteria for the participation of individuals was applied: to be older, male or female, and with registered permanent residence in the nearby areas of UBS. The presence, in the elderly, of cognitive impairment (Alzheimer's, Parkinson's, dementia, delirium) was considered an exclusion criterion once they might prevent the collection of data, as in contact with the local team of UBS.

We conducted a pilot test with six seniors who were not included in the study, and there was no need for the changes in the data collection instrument. For data collection, we used structured interviews with an instrument

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containing socio-demographic data, falls and the environmental factors from the International classification of functioning, disability and health (ICFDH). At this point, we used the third part, corresponding to the elements of the environmental factors from the ICFDH.

Elderly people who agreed to participate were scheduled to interview at their homes with pre-established date and time. When at the meeting, the free and informed consent (IC) in duplicate was presented, in which the elderly who agreed to participate in the study signed or put their finger printing.

The data were organized in an Excel spreadsheet and analyzed using the computer program *Statistical Package for Social Sciences* - SPSS Version B the 20.1. Nominal variables were described considering absolute and percentage frequencies, while the numerical variables were expressed as average and standard deviation.

Independence tests were used to evaluate the association of the independent variable: environmental factors of the ICFDH (Food, Clothing, Products and general technology for personal use in daily life, products and technology for personal use in daily life, products and technologies for communication, architecture, construction, materials and architectural technologies in buildings for private use) in the presence of a dependent variable: Pearson's chi-squared test was used to verify the associations between categoric variables.To check the magnitude of effect, it was calculated the ratio of prevalence and its respective confidence interval of 95%. For environmental factors, the Mann-Whitney test was used. Finally, the variables were inserted into a model to predict the risk of falls. The appropriate model for cross-sectional studies was the Poisson Regression model.The criterion for entering the variable into the model was that it produced a p-value <0.10 in the bivariate analysis. The level of significance adopted was 5% (p = 0.05).

RESULTS

The results obtained in this study are part of a population-based sample based on the environmental elements of the ICFDH, Table 1.

Tabela 1. Results from the environmental elements from the ICFDH, Rio Grande do Sul, Brasil, 2013.

Variables	Total Sample n=167	60 - 69 years old n=82	70 - 79 years old n=65	≥ 80 years old n=20	p**
Use of medications -n(%)					
AAS	101 (60,5)	54 (65,9)	28 (43,1)	19 (95,0)	<0,001
Diclofenac	46 (27,5)	44 (53,7)	2 (3,1)	0 (0,0)	<0,001
Paracetamol	86 (51,5)	35 (42,7)	36 (55,4)	15 (75,0)	0,025
Nº of environmental factors from ICFDH - Average (P25 - P75)					
Food	16 (15 -17)	16 (15-17) <sup>b</sup>	16 (15-17) <sup>b</sup>	14(12-16) <sup>a</sup>	0,002 <sup>#</sup>
Clothing	12 (9 - 15)	12 (11- 15) <sup>b</sup>	11 (9- 31) <sup>ab</sup>	9,5 (8-11) <sup>a</sup>	0,010 <sup>#</sup>
Architecture	27 (24 - 30)	28 (25 - 31)	27 (24 - 29)	26 (19- 31)	0,054 <sup>#</sup>

Teste qui-quadrado de Pearson; # teste de Kruskal-Wallis; <sup>a,b</sup> Letras iguais não diferem pelo teste de Mann-Whitney a 5% de significância

In this study, environmental factors of the ICFDH that show influence of falls were related to the use of medicines. The younger elderly (<70 years) who used more diclofenac (p <0.001) had higher number of environmental factors of the ICFDH, specifically in relation to their food and clothing habits, when compared with older ones (80 or older). However, older seniors (80 and above) who use more aspirin (p <0.001) and paracetamol (p <0.025) also had the highest prevalence of falls in the sample.

According to the Mann-Whitney test there was no significant association between environmental factors of the ICFDH (food, clothing and architecture) and the occurrence of falls. It was observed that, from the three age groups studied, the one with greater asymmetry with food and clothing was the 80 years old or more.

DISCUSSION

In this study, the use of drugs showed statistically significant association with falls, because along with changes in the age structure of the population, epidemiological changes could be detected, with the replacement of the main causes of death from parasitic diseases, in an acute scenario, to chronic noncommunicable diseases (NCDs). <sup>15</sup> These diseases can become long-term problems and require, for appropriate care, lots of material and human resources and its high prevalence makes the elderly large consumers of medicines. <sup>16</sup>

The presence of NCDs in the aging course deteriorates the process and increases the likelihood of older people to become more dependent, contributing to falls. <sup>15</sup> In this

sense, the risks involved in drug use by the elderly are higher when compared with the rest of the population, because the elderly have different responses to drug use. This scenario is brought by changes in pharmacokinetics and pharmacodynamic, typical from the aging process, which make the elderly more vulnerable to interactions between medications, side effects and adverse reactions. <sup>17</sup>

The female gender and the elderly were the sociodemographic characteristics most often associated to drug use. <sup>18</sup> The explanation for the positive association between age and greater use of medicines is due to a higher incidence of health problems in the late stages of life, during which generally occur long-term diseases with greater severity, whose treatments and relief of symptoms require drug therapy. <sup>19</sup>

Factors related to drugs stand as a major cause of falls. Despite their countless benefits, some drug classes, such as psychotropic drugs, corticosteroids, cardiovascular and non-steroidal anti-inflammatory drugs, are associated with increased incidence of falls once they cause modifications in the bone, muscle, motor, postural structures, hypotension and dizziness. <sup>20</sup>

In the sample analyzed, the food habits showed greater asymmetry in the age range above 80 years old, but this aspect was not considered statistically significant for falls in the elderly. A study carried out in Erechim/RS noted that older people present self-care behavior, seek to have good food and do regular exercise in order to keep healthy; also they claim they choose the most appropriate



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and most comfortable shoes to prevent falls.<sup>21</sup>

The integrative review on the risks of falls in elderly proposed nursing actions in order to prevent these events involving changes in the habits of the elderly, such as nutritional education, aiming the adoption of a healthy diet rich in calcium; housing reorganization, making their homes safes; awareness of their physical condition, to strengthen their motor system. It noted that the nurse can help the elderly in prevention of falls by stimulating the increase of mobility, guiding them about eating healthy and keeping their environment safe and free of risks for accidents.<sup>22</sup>

Regarding the aspect of clothing, this study showed asymmetry in the age from 80 years old and above, even though this variable was significant for falls in domiciled elderly. It is noteworthy that the elderly should avoid using loose clothing that could get stuck on the cable os pans, providing the risk for falls.<sup>23</sup>

With regard to architecture, there were no significant association to the falls. It is known that the environment will be among the factors that influence the functionality in old age<sup>24-25</sup> and it must offer security, incentives, personal control, social interaction, and favor the adaptation to the changes besides being familiar to the elderly.<sup>26</sup>

The ICFDH comprises from the immediate environment of the individual to their general environment, valuing the characteristics of the physical, social and the attitude worlds, once they represent facilitator or limiting impacts on the components of functioning and disability. Not only on health, but also in the activities and participation in different situations. The society may restrict the development of the elderly by offering an environment with barriers or simply by not providing facilitators needed to perform a given task.<sup>27</sup>

The physical environment should be observed both in architecture (wall, floor, lighting, ventilation, circulation), and in the furniture features such as layout and number<sup>28</sup>. By analyzing the home environment, it is important to check the following criteria: mobility (dimensions of space for tasks), guidance (if the envirement has information for access and functionality) and usability (interaction between the individual and the items of the environment).<sup>29</sup>

In the scenario, the development and the encouragement of activities that strengthen the social reinsertion of the elderly and essential. For such, it's necessary to apply the efforts needed that englobe professionals from different areas of heath care, in special

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the nurses. The ICFDH proposes a new paradigm of functionality and disability that can serve as a multidisciplinary care model.<sup>30</sup>

Nurses, by using the ICFDH, perform an individualized assessment of the elderly, identifying their affected basic needs and developing / programming a care plan with a view in order to maintain an active aging process. In this perspective, ICFDH shows up as another path / challenge for nurses so that they can advance, along with other health professionals from their teams, identifying and classifying functionality without being based on the disease itself. This will promote cooperation in resolving social issues and social security that may arise.

It is necessary that the nurse go beyond the clinical / curative approach, moving on to perform multi-activity actions with interdisciplinary trends in order to maintain the autonomy and independence of older people, promoting active aging and supporting the family and caregivers of dependent elderly.<sup>12</sup>

The main limitation in this research is related to the participation of the elderly, as we initially wanted to apply the instrument in all the registered participants, but given the refusal of some and the lack of address of some other it was necessary to revise the initial forecast and decrease the number of respondents to this research.

## CONCLUSION

This study allowed us to observed that the International Classification of Functioning, Disability and Health (ICFDH), presented indicators of factors that may influence the occurrence of falls in domiciled elderly.

The identification of some environmental factors of the ICFDH showed to be statistically significant for falls in the elderly, with emphasis on the use of drugs. The elderlies with less than 70 years old that use more diclofenac showed more changes in the environmental factors of the ICFDH, specifically in relation to their food and clothing habits, when compared with those with 80 years old or more. However, those aged from 80 years old and over use more aspirin and paracetamol and also had the highest prevalence of falls in the sample.

In the nursing care for the elderly the risk and the benefit of drug usage, as well as the search for strategies in drugs' administration schedule, aim at helping the elderly to remain less sleepy during the performance of their daily activities and, therefore, lowering the risks of falling.

Moreover this research brought up the possibility of using some environmental factors of the ICFDH in research directed to Nursing, which leads us to understand that they enabled the awareness of facilitators and / or obstacles to prevent falls in the elderly. It was identified, before the findings in this study, that nurses who are inserted in different contexts will be able to interfere and thus strengthen the search for the prevention of falls.

The literature has shown that the ICFDH is being used by different health professionals, however, studies about falls in elderly performed by nurses are still at a small account. This situation has been changed gradually, because it is from this type of work that it will be possible to offer to the elder individual care and prevention of falls that are more appropriate to their needs.

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