



## Functional limitations related to foot pain in the elderly

Limitação funcional relacionada ao pé doloroso em idosos

Limitación funcional relacionada con el pie doloroso en ancianos

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**Objective:** to investigate the association between foot pain and functional disability in the elderly. **Methods:** descriptive study conducted among the elderly attended in a geriatric outpatient clinic of a university hospital. The sample consisted of 114 elderly who reported foot pain. Data was collected through subsidized interview, using structured instrument, covering demographic variables and the Manchester Foot Pain and Disability Index in Elderly and the Mini Mental State Examination.

**Results:** there was a high incidence of foot pain among women and young elderly as well as significant inability to perform certain daily activities. **Conclusion:** it is identified the need for special attention to the health of elderly reporting foot pain, since this tends to restrict daily activities, causing decreased quality of life, immobilization and possible episodes of falls.

**Descriptors:** Aged; Foot; Pain; Geriatric Assessment; Nursing.

**Objetivo:** verificar a associação entre pé doloroso e a incapacidade funcional em idosos. **Métodos:** estudo descritivo, realizado entre os idosos atendidos em um ambulatório de geriatria de um Hospital Universitário. A amostra constou de 114 idosos que relataram pé doloroso. Dados coletados por meio de entrevista subsidiada por instrumento estruturado, contemplando variáveis demográficas e Índice Manchester de Incapacidade Associada ao Pé Doloroso em Idosos e o Mini Exame do Estado Mental. **Resultados:** verificou-se alta incidência de pé doloroso entre as mulheres e idosos jovens, bem como significativa incapacidade para realizar determinadas atividades rotineiras. **Conclusão:** identifica-se a necessidade de atenção especial à saúde do idoso que relata dor nos pés, visto que, este tende a restringir as atividades habituais, causando diminuição da qualidade de vida, imobilização e possíveis episódios de quedas.

**Descritores:** Idoso; Pé; Dor; Avaliação Geriátrica; Enfermagem.

**Objetivo:** verificar la asociación entre pie doloroso y discapacidad funcional en ancianos. **Métodos:** estudio descriptivo, realizado entre ancianos asistidos en ambulatorio de geriatría de un hospital universitario. Muestra constituida por 114 ancianos que reportaron dolor en el pie. Datos recolectados a través entrevista subsidiada por estructurada, cubriendo variables demográficas e Índice de Manchester de Discapacidad asociada a Pie Doloroso en Ancianos y Mini Examen del Estado Mental. **Resultados:** alta incidencia de dolor en el pie entre mujeres y ancianos jóvenes, así como incapacidad significativa para realizar determinadas actividades cotidianas. **Conclusión:** necesidad de prestar especial atención a la salud de ancianos que relatan dolor en los pies, ya que esto tiende a restringir actividades diarias, causando disminución de la calidad de vida, detenciones y posibles episodios de caídas.

**Descriptores:** Anciano; Pie; Dolor; Evaluación Geriátrica; Enfermería.

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## Introduction

Population aging is seen as one of the most important demographic transitions observed worldwide. It is a multifaceted issue, in which the various mechanisms are not completely understood, although several studies elucidate some of its features that have come to happen in a faster way. This event took place in Brazil after socioeconomic changes, guided by the change in the demographic profile of its population. This change has culminated in a decrease in mortality rates, increasing labor force and an increase in the number of elderly<sup>(1-2)</sup>.

In this context, Brazil is, in 2015, the seventh world position in number of elderly; projections show that, possibly in 2025, it will occupy the sixth position<sup>(3)</sup>. With a higher concentration of elderly in the population it was observed increased incidence of chronic diseases, which can be accompanied by sequelae, which limit the functional performance and generate dependency. The presence of multiple diseases with different levels of severity can influence the performance of activities of daily living and reduce the autonomy of the elderly<sup>(4)</sup>.

Various problems that can affect this population and it is worth stressing those that impair their functional capacity. Among these are the changes in anatomical and physiological structures of the feet, which may be due to systemic diseases, disorders of gait and foot fractures that compromise the integrity of nails, skin, nerves, vessels and bony structures<sup>(5)</sup>. Such injuries generate some consequences for the life of the elderly, such as the decrease in ability to perform activities of daily living, decreased strength, balance and mobility, gait disturbance, increased risk of falls and of postural instability resulting in functional disability<sup>(6)</sup>.

Based on these considerations, the relevance of this study is confirmed by the need to know more and more about foot changes in the elderly and its association with functional disability that results in reduced autonomy and quality of life.

The results of this study will encourage the identification of the main foot problems experienced by the elderly, since the literature involving this issue is weak and scarce. In this sense, the results of this research can raise resources for professionals who deal with elderly patients carrying this problem, especially nurses, allowing the recognition of the specific characteristics of foot changes and the risks that surround them. In this context, this study aimed to determine the association between foot pain and functional disability in the elderly.

## Method

It is descriptive, quantitative study conducted with elderly seen in a geriatric outpatient clinic of a university hospital in the city of João Pessoa. The sample of probabilistic type, selected through simple sampling technique. For the calculation, the following formula was considered:  $n = Z^2 PQ/d^2$ , where  $n$  = minimum sample size;  $Z$  = reduced variable;  $P$  = probability of finding the phenomenon studied;  $Q = 1-P$ ;  $d$  = desired accuracy. It is adopted  $p = 50\%$ , and sampling error parameter of  $5\%$ , and  $95\%$  confidence level. According to data from the clinic, there were 175 elderly registered in January 2013. After performing the calculations, the sample consisted of 114 individuals, chosen at random.

The elderly who reported foot pain were included as well as those with scores higher than 13 (for illiterates) and 17 (for literates) in the Mini-Mental State Examination<sup>(7)</sup>. The study excluded those with moderate/severe cognitive impairment, amputations and/or use prosthetic limbs; stroke sequelae; Parkinson's disease; lower limbs and/or spine fractures, those using wheelchair, who had impaired speech and/or hearing that would prevent them from responding to interview as well as those who did not report foot pain. The data collection instrument was applied by interviewers linked to the Group for Study and Research on Adult and Elderly Health, who have been properly trained to carry out such procedure, with

information on the operational aspects of data collection instrument and the study objectives.

This study was conducted from June 2012 to January 2013, and data collection was held from October to December 2012, through interviews performed with a structured instrument composed of two parts. The first comprised questions about sex, age, and the second addressed the association between foot pain and functional disability using the validated and adapted version for the Portuguese language of the Manchester Foot Pain and Disability Index in Elderly<sup>(8)</sup>.

The Manchester Foot Pain and Disability Index in Elderly has nineteen statements, divided into four subscales: Nine statements on disability, five statements on pain, three statements on preoccupation and two statements on difficulty. In each statements, the elderly had to point the frequency of symptoms in the feet, in the last thirty days. If the disability was absent, the alternative "never, none of the time" was chosen. If present, one of the alternatives "Yes, on some days" or "yes on most/every day(s)" was chosen. Soon after, the points obtained by the elderly in the assessment were added, thus expressing the degree of disability evidenced. The score ranged from zero to 38.

Data analysis was carried out in quantitative approach by using descriptive statistics for the univariate variables. Therefore, it was conducted distribution of absolute and relative frequencies for categorical variables and means with standard deviation for continuous variables. Regarding the comparison of the mean of the Manchester Foot Pain and Disability Index in Elderly between groups, bivariate analyzes were performed using the Student's t-test for independent samples, considering the normality of the data, previously tested using the Kolmogorov-Sminorv test. The Chi-square test was used to compare the main categorical variables in accordance with the objectives proposed for the study. For this purpose, we used the Statistical Package for the Social Sciences program, version 20.0, which is adequate to achieve the objectives and allows the

accuracy and generalization of results.

The study project was examined and approved by the Research Ethics Committee of the University Hospital Lauro Wanderley, opinion No. 28/12, in compliance with the directives and regulations of research involving humans in force at the time of approval.

## Results

As for the characterization of the sample, there was prevalence of females (85.1%), with predominant age group of 60-69 years old (51.7%). Regarding the score of the elderly on Manchester Foot Pain and Disability Index in Elderly test, it was found that this ranged from 5 to 38 points, with mean of 24.7 and standard deviation of 7.4. By correlating the variables, it was found that, on average, seniors who reported having foot pain had higher scores on Manchester Foot Pain and Disability Index in Elderly test ( $M = 25.2, SD \pm 3.18$ ) than those individuals who did not have foot pain ( $M = 15.43, SD \pm 6.85$ ). This difference was statistically significant  $t(114) = -3.53, p = 0.001$ .

In the analysis of the frequency of responses of the elderly to statements of Manchester Foot Pain and Disability Index in Elderly (Table 1), it was found that with regard to functional limitation, in the item "on most days" 78.5% of the elderly avoid walking on hard and rough surfaces, 71.1% avoid standing for a long time, 66.2% avoid walking long distances, 61.2% avoid walking outside at all, 55.4% walk slowly, and 57.9 % are concerned about the shoes they have to wear.

By correlating the occurrence of foot pain and the variables that make up the Manchester Foot Pain and Disability Index in Elderly, there was statistical significance in the following data: I do everything with discomfort ( $p = 0.003$ ), I get irritable when my feet hurt ( $p = 0.001$ ), I feel self-conscious about shoes I have to wear ( $p = 0.002$ ), I have constant pain in my foot( $p < 0.001$ ), My feet are more painful in the evening ( $p < 0.001$ ) and I get shooting pains in my feet ( $p < 0.001$ ).

**Table 1** - Frequency distribution of the Manchester Foot Pain and Disability Index in Elderly variables among the elderly who reported the occurrence of foot pain. (n= 114)

Variables	Never	On some days	On most days
	n (%)	n (%)	n (%)
I avoid walking outside at all	18 (14.9)	29 (24.0)	74 (61.2)
I avoid walking long distances	16 (13.2)	25 (20.7)	80 (66.1)
I don't walk in a normal way	26 (21.5)	40 (33.1)	55 (45.5)
I walk slowly	14 (11.6)	40 (33.1)	67 (55.4)
I have to stop and rest my feet	36 (29.8)	39 (32.2)	46 (38.0)
I avoid hard or rough surfaces when possible	3 (2.5)	23 (19.0)	95 (78.5)
I avoid standing for a long time	15 (12.4)	20 (16.5)	86 (71.1)
I catch the bus or use the car more often	9 (7.4)	58 (47.9)	54 (44.6)
I need help with housework/shopping	32 (26.4)	43 (35.5)	46 (38.0)
I do everything with discomfort	10 (8.3)	56 (46.3)	55 (45.5)
I get irritable when my feet hurt	33 (27.3)	51 (42.1)	37 (30.6)
I feel self-conscious about my feet	32 (26.4)	30 (24.8)	59 (48.8)
I feel self-conscious about the shoes I have to wear	21 (17.4)	30 (24.8)	70 (57.9)
I have constant pain in my feet	12 (9.9)	52 (43.0)	57 (47.1)
My feet are worse in the morning	12 (9.9)	64 (52.9)	45 (37.5)
My feet are more painful in the evening	20 (16.5)	44 (36.4)	57 (47.1)
I get shooting pains in my feet	38 (31.4)	49 (40.5)	34 (28.1)
I am unable to carry out my previous work	30 (24.8)	52 (43.0)	39 (32.2)
I no longer do all my previous activities	28 (23.1)	52 (43.0)	41 (33.9)
Total	405 (100.0)	797 (100.0)	1097 (100.0)

## Discussion

It was observed prevalence of female among the elderly, which is in agreement with the literature, which describes this feature as “aging feminization”. In North America and Japan, currently, women live seven years longer than men, whereas in France they live about eight years longer than the opposite sex. In Brazil, the projections say that in 2020 there will be 78 men for every 100 women<sup>(9)</sup>. Regarding the distribution by age, there was predominance of the age group of 60-69 years old. These findings are similar to a study<sup>(6)</sup> conducted on painful foot of the elderly associated with functional disability, involving 100 elderly, of which 43% were in the aforementioned age group.

As regards the association of the painful foot with functional disability, the scale<sup>(10)</sup> measures the appearance of disabilities resulting from this event, and it was recently used in epidemiological studies and clinical trials. In epidemiology, it has been used to produce a dichotomized measure of disability. In this study, it was shown that 99.1% of seniors reported, at least on an item, difficulties in carrying out the proposed activities on most days. These results converge with findings in a research<sup>(11)</sup> conducted with elderly residents in the city of São Paulo, which used the same instrument, showing that 70% of respondents expressed some sort of discomfort due to pain in the feet.

The mean score of Manchester Foot Pain and Disability Index in Elderly among the elderly who reported painful feet was 24.7. Among women, the

average was 24.9, featuring greater difficulties in carrying out activities than men, who presented a mean of 23.9. Similar results were shown on a Danish study, which revealed highest means among the female elderly (16.6) compared to the male elderly (14.7)<sup>(12)</sup>. These findings are consistent with the relevant literature<sup>(6,10-13)</sup>, which show compliance that women not only develop, but also verbalize more often pain in the feet than men. This is related, among other things, to the type of shoes worn throughout life, which increase the likelihood of developing foot problems. Furthermore, women have reduced tolerance to pain when compared to the opposite sex, which makes them more likely to report this event<sup>(10,13)</sup>.

The incidence of self-reported pain in the feet showed statistically significant correlation with the Manchester Foot Pain and Disability Index in Elderly, demonstrating that elderly people who reported foot pain could present greater degree of disability. It is noteworthy that not all foot problems generate pain or functional limitations, however, people with foot pain have a lower level of well-being, as well as higher risk of decreased mobility, balance and gait cycle and may therefore be a contributing factor to functional disability and falls in the elderly<sup>(6,10)</sup>.

Concerning table 1, it was found that the items that presented more evidence in the item "on most days" were: I avoid walking on hard and rough surfaces whenever possible (78.5%), I avoid standing for a long time (71.1%) and I avoid walking long distances (66.1%). These results are consistent with those found in a Brazilian research<sup>(6)</sup>, in which the elderly involved had similar difficulties, differing only in the statement: I catch the bus, subway or use the car more often.

Despite the high prevalence of foot problems and their losses, these problems are often not perceived as the elderly consider them an inevitable consequence of aging, rather than a medical condition.

Although the association between foot pain and impaired functional capacity in older people are not well understood in the literature<sup>(14)</sup>, study in Australia says that foot problems cause significant impact on decreased quality of life and self-perceived health, concluding that the elderly need to have guaranteed access to foot treatment<sup>(15)</sup>.

By correlating the occurrence of foot pain and the variables that make up the Manchester Foot Pain and Disability Index in Elderly, there was statistical significance in the following data: I do everything with discomfort, I get irritable when my feet hurt, I am self-conscious about the shoes I have to wear, I have constant pain in the feet, My feet are more painful in the evening and I get shooting pains in my feet. Given that the foot is the only direct source of contact with the ground, when performing such tasks it is plausible to infer that the presence of pain in the feet may affect the balance, resulting in greater caution and limitation by the elderly to carry out some activities<sup>(13)</sup>.

## Conclusion

The results show that the occurrence of functional limitations associated with pain in the feet was high among the elderly investigated, being more frequent in female individuals aged from 60 to 69 years old. As for the Manchester Foot Pain and Disability Index in Elderly, statements that showed greater evidence in the item "on most days" were: I avoid walking on hard and rough surfaces whenever possible, I avoid standing for long time and I avoid walking distances.

Among the limitations of this study, it is emphasized that it characterizes only a local reality. However, it is observed that these research results are relevant as they instigate reflection on health professionals and on the elderly, in order to raise awareness to the magnitude of this event, its high

prevalence and consequences on the quality of life of seniors. It is therefore recommended investigation on foot pain and its association with functional limitations in other scenarios in order to verify the dimension and significance of this event in the life of the elderly in their various contexts.

The identification of factors associated with foot pain is very important to the development of strategies for the prevention of limitations, to early detection and monitoring of installed disabilities, as well as to prevent decreased mobility, balance, gait and consequently the occurrence of falls, which is characterized as one of the most debilitating events in this population. It is worth noting the importance of having special health care for the elderly who report foot pain, as this condition tends to restrict their usual activities, causing decreased autonomy and quality of life.

## Collaborations

Oliveira FMRL and Barbosa KTF contributed to the conception, design, analysis and interpretation of data. Albuquerque SGE and Rodrigues MMD contributed to final approval of the version to be published. Santos KFO and Fernandes MGM contributed to writing the article and relevant critical review of the intellectual content.

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