

# Foot changes of hospitalized elderly individuals: a careful look at nursing

*Alterações nos pés do idoso hospitalizado: um olhar cuidadoso da enfermagem*

*Cambios a los pies de los ancianos hospitalizados: una mirada cuidadosa en enfermería*

Joiziane Santos da Silva<sup>1</sup>  
Fátima Helena do Espírito Santo<sup>1</sup>  
Carla Lube de Pinho Chibante<sup>1</sup>

1. Universidade Federal Fluminense.  
Niterói, RJ, Brazil.

## ABSTRACT

**Objective:** To characterize the profile of elderly hospitalized patients in foot wards of a university hospital; to identify the foot care demands of these patients; and to examine the possibilities of actions of nurses with them. **Methods:** A quantitative, exploratory-descriptive approach was followed. A total of 40 hospitalized elderly people participated in this study. An instrument including questions about physical examination of feet and a sensitivity test using Semmes-Weinstein Monofilament (10g), submitted to simple statistical analysis, was used. **Results:** A total of 32 (80%) elderly people had dry skin; 30 (75%), decreased sensitivity; 27 (67.5%), calluses; 22 (55%, cramps;) and 20 (50%), hallux valgus. **Conclusion:** Health professionals need to recognize the demands of the elderly population, including foot care, as foot changes can cause pain and discomfort and they can interfere with the daily lives of the elderly, creating risks that aggravate their illness and contribute to their disability.

**Keywords:** Foot; Aged; Hospitalization; Nursing Care; Geriatric Nursing.

## RESUMO

**Objetivos:** Caracterizar o perfil podológico de idosos hospitalizados nas enfermarias de um hospital universitário; identificar as demandas de cuidados com os pés de pacientes idosos hospitalizados; e analisar as possibilidades de atuação do enfermeiro junto a esses idosos. **Métodos:** Abordagem quantitativa, exploratória-descritiva. Realizada com 40 idosos hospitalizados, mediante aplicação de um instrumento abordando questões sobre exame físico dos pés e teste de sensibilidade utilizando Monofilamento de Semmes-Weinstein de 10g, submetidos à análise estatística simples. **Resultados:** Identificou-se que 32 (80%) idosos tinham pele ressecada, 30 (75%) sensibilidade diminuída, presença de calosidade em 27 (67,5%), câimbras em 22 (55%) e Hálux Valgus em 20 (50%). **Conclusão:** Os profissionais de saúde precisam reconhecer as demandas da população idosa, incluindo os cuidados com os pés, já que alterações podais podem causar dor e desconforto capazes de interferir no dia a dia dos idosos, gerando riscos para agravar o adoecimento e contribuir para a incapacidade deles.

**Palavras-chave:** Pé; Idoso; Hospitalização; Cuidados de Enfermagem; Enfermagem Geriátrica.

## RESUMEN

**Objetivos:** Caracterizar el perfil podológico de los pacientes ancianos internados en un hospital universitario; identificar las demandas de cuidado con los pies de estos pacientes; y examinar las posibilidades de actuación del enfermero. **Métodos:** Estudio cuantitativo, exploratorio y descriptivo. Realizado con 40 personas mayores hospitalizadas, a través de la aplicación de preguntas sobre el examen físico de pies y pruebas de sensibilidad con Monofilamento de Semmes-Weinstein de 10g, sometidos al análisis estadístico simple. **Resultados:** Se identificó que 32 ancianos (80%) tenían la piel seca; 30 (75%), sensibilidad disminuida; 27 (67,5%), presencia de callo; 22 (55%), calambres; y Hallux Valgus en 20 (50%). **Conclusión:** Los profesionales de salud necesitan reconocer las demandas de los pacientes ancianos, incluyendo el cuidado de los pies, ya que las alteraciones pueden causar dolor y molestias capaces de interferir en la vida de las personas mayores, agravando la enfermedad y contribuyendo con la incapacidad de ellos.

**Palabras clave:** Pie; Anciano; Hospitalización; Atención de Enfermería; Enfermería Geriátrica.

**Corresponding author:**  
Fátima Helena do Espírito Santo.  
E-mail: fatahelen@hotmail.com

Submitted on 07/21/2016.  
Accepted on 10/24/2016.

DOI: 10.5935/1414-8145.20170010

## INTRODUCTION

Population aging continues to increase worldwide. In developing countries such as Brazil, this event poses more and more challenges both in the social and economic areas. With the demographic transition process, an epidemiological transition also occurs, including three basic changes: replacement of communicable diseases by Non-Communicable Chronic Diseases (NCD) and external causes as the main causes of death; shift of the load of morbi-mortality from younger individuals to older ones; and change from the predominance of mortality to the predominance of morbidity.<sup>1</sup>

Chronic diseases have a close relationship with foot complications and the following stand out: *Diabetes Mellitus* (DM), which affects 19.9% of individuals aged from 65 to 74 years, and cancer, which affects 9.4% of those aged from 60 to 74 years.<sup>2</sup>

One of the main complications of DM is the diabetic foot, responsible for the great number of hospitalizations and for contributing to the development of the disability and dependence process.<sup>3</sup> In contrast, one of the consequences of the chemotherapeutic treatment of cancer is the hand-foot syndrome, which can result in discomfort that can affect the Activities of Daily Living (ADL) of patients.<sup>4</sup>

Thus, foot changes can interfere with the execution of ADL, contributing to the development of disabilities in elderly individuals, as they are capable of causing pain and discomfort, having a negative effect on posture and walking. Foot pain affects between 20% and 30% of elderly individuals living in the community and it is associated with the reduction in the ability to perform activities of daily living and balance and walking problems, thus increasing the risk of falls.<sup>5</sup>

Foot changes result from walking disorders, traumas and mistreatment of feet, which compromises the integrity of nails, skin, nerves and bone structure. However, due to complications such as the "diabetic foot" and "hand-foot syndrome", it could be affirmed that the feet can also show acute or chronic complications resulting from NCCDs.<sup>6</sup>

Previous studies have revealed that foot problems significantly affect quality of life in the elderly population. A study performed in 2014 that aimed to observe the characteristics of foot problems in 50 elderly individuals living in an area covered by a Family Health Unit in a city located in the countryside of São Paulo state, Southeastern Brazil, found that pulse changes; long, deformed and thick nails; thick skin with hyperkeratosis; decrease in pain and vibration sensitivity; and foot pain restricted activities of daily living in 70% of elderly individuals.<sup>7</sup>

In addition to pain, discomfort, postural instability and walking disorders, foot changes, especially those that bring more evident deformities, can contribute to social isolation, resulting in functional reduction in these elderly individuals and negatively affecting their quality of life.<sup>8</sup>

In view of this situation, foot assessment and health professionals' knowledge about the characteristics and changes in elderly feet can promote the implementation of adequate

interventions and instructions on self-care, aiming to prevent the occurrence of outcomes with a high psychological, social and economic cost that directly reflect on the loss of independence of elderly individuals.

Thus, educational strategies such as the use of booklets and the implementation of protocols can contribute to the minimization of foot problems as it enables access to information that promotes the assessment and prevention of such problems and the onset of disabilities and complications resulting from them.

In this sense, considering the fact that foot changes in elderly individuals are caused by the aging process itself, although likely to be aggravated when associated with chronic diseases such as diabetes, osteoarthritis, arthritis, osteoporosis and overweight, apart from the habit of using inadequate footwear and lack of foot care, a careful assessment of such individuals is required. This is particularly important in the context of hospitalization, when they are more vulnerable physically and emotionally, aiming to identify, evaluate and prevent possible changes in their feet, which, in addition to increasing the risk of falls, can have repercussions in their treatment and promotion of their recovery with regards to their independence, autonomy and functional capacity.

The present study had the following objectives: to characterize the foot profile of elderly individuals hospitalized in infirmaries of medical and surgical clinics of a university hospital; to identify the demands of foot care in hospitalized elderly patients; and to analyze the possibilities of nursing work with these patients.

## METHODS

An exploratory descriptive study with a quantitative approach was performed in a university hospital located in the state of Rio de Janeiro, Southeastern Brazil, in the male and female infirmaries of the Medical and Surgical Clinics.

A total of 40 elderly individuals hospitalized in these clinics participated in the study, according to the following inclusion criteria: elderly individuals hospitalized from the age of 60 years, of both sexes, and with a certain type of deformity in their feet. Additionally, the exclusion criteria were as follows: elderly individuals who had been transferred and/or discharged during the data collection period.

The present study was part of the research project entitled "Hospitalization of the Elderly: Perspectives of Intervention in the Health Care Process", approved by the Research Ethics Committee of the institution under official opinion number 996.459 from October 3<sup>rd</sup> 2014, in accordance with Resolution 466 from December 12<sup>th</sup> 2012 established by the *Conselho Nacional de Saúde* (CNS - National Health Council), which regulates human research.

Before data were collected, the researcher introduced herself to the nurses in charge of the respective units, formalizing their presence and requesting an authorization to perform the study. All participants were instructed on the study objectives and its possible advantages and requested to sign an Informed Consent Form.

Data production occurred from July to August 2015 through the application of a questionnaire developed by the researcher herself. This questionnaire included questions about socio-demographic questions, elderly individuals' history of health problems associated with foot changes; physical examination of their feet, including pulse checking, nail changes (onycholysis), presence of edema, and skin changes (dryness, fissures, scaling); and sensitivity test using the Semmes-Weinstein Monofilament (10g), when the evaluator inspected ten specific points in the feet (one on the dorsal region and nine on the plantar region).

To investigate the frequency of functional disability associated with foot pain, Manchester Foot Pain and Disability Index (MFPDI) was used. The MFPDI developed by Garrow et al. and published in 2000 is a specific instrument used to identify and assess the level of disability as the result of foot pains. The translation, cultural adaptation and validation to the Portuguese language was performed by Ferrari et al. and published in 2008.<sup>6</sup>

During the data organization stage, files were numbered according to the data collection in an increasing order and categorized according to sex. Socio-demographic data and Manchester Foot-Pain Disability Index application data were shown by characteristics on a table designed on the Microsoft Office Word software. In contrast, data on prevalent diseases and foot changes and symptoms were made available on a spreadsheet, shown on Excel graphs, and subsequently treated through simple statistical analysis.

## RESULTS AND DISCUSSION

A total of 40 elderly individuals participated in this study, of which 24 (60%) were females and 16 (40%) were males. Participants were aged from 60 to 93 years, with a mean age of 69.5 years. This number is higher than that obtained in a study performed in the same institution with 20 elderly individuals, whose mean age was 68.9 years.<sup>9</sup>

Regarding age distribution, the 60-to-69-year age group predominated, thus corroborating the data from a study that found an association between painful feet and functional disability in 114 elderly individuals in a geriatric outpatient clinic of a university hospital, where the same age group predominated. This age group should be emphasized as the target of new approaches to foot health promotion.<sup>10</sup>

Among the elderly individuals in this study, the majority were females, which is in agreement with the literature on the "feminization process of aging".<sup>11</sup>

Regarding marital status, four (10%) elderly individuals were single, 18 (45%) were married, 12 (30%) were widowed, three (7.5%) were divorced, and three (7.5%) live with a partner. It should be noted that there were 12 widows, which corresponds to 50% of all women in this study, whereas there was a predominance of married individuals among males, 12 in all (75% of all men).

The percentage of married elderly individuals was lower than that of a study performed with 121 elderly individuals in a geriatric outpatient clinic of a university hospital,<sup>12</sup> where

the rate of those married was higher than 51%. In contrast, the percentage of single elderly individuals was close to that obtained in the abovementioned study, which obtained 10.7% of such individuals. Moreover, regarding widowed individuals, the rate found in the present study was only 1.9% higher, as the percentage of widowed elderly individuals in the abovementioned study was 28.1%. In many cases, widowed elderly individuals ended up being alone, increasing their feelings of loneliness and abandonment, which could aggravate their chronic problems.

Regarding level of education, four of them (10%) were illiterate, 18 (45%) had not completed primary school and two (5%) had completed primary school, and 16 (40%) had completed secondary school. Thus, in the present study, 22 (55%) elderly individuals were either illiterate or had not completed primary school, showing the low level of education in this population. The percentages differ from those found in a study performed in the same university hospital, which included six individuals (30%) who were illiterate, four (20%) who had completed primary school, one (5%) who had not completed secondary school, two (10%) who had completed secondary school, six (30%) who had not completed higher education, and one (5%) who had completed higher education.<sup>9</sup>

Low level of education is an aggravating factor for the onset of complications associated with chronic diseases such as *Diabetes Mellitus*, due to the limited access to information, poor reading skills and low understanding of self-care. It should be noted that education, as a prevention tool, can reduce primary care for diabetes-related amputations by 50%.<sup>13</sup>

With regard to income, 24 elderly individuals (60%) were retired, eight (20%) received a pension, five (12.5%) did not receive their own income and depended on their family financially (spouse, siblings and/or daughters/sons) and three (7.5%) were self-employed. These data contrast with the results of the study performed with 20 elderly individuals in an institution, where 16 (80%) were retired and four (20%) did not have an income.<sup>9</sup>

In the present study, 28 (70%) elderly individuals had an income between one and two minimum wages per month; eight (20%), between two and five minimum wages; and four (10%), less than one minimum wage or no income at all. These data can have a direct repercussion on the life condition of these elderly individuals, who are frequently in the lowest social classes (poverty or extreme poverty) and support their families financially.

The close relationship between low-income elderly individuals with worse health conditions and the difficulty in access to health services has already been confirmed, revealing the need for support measures, so that they can be followed in health institutions in a comprehensive way. The aim is to prevent and treat diseases, most of which are chronic, requiring continuous drug use and instructions on self-care and including the family members who comprise the support network for these individuals.<sup>14</sup>

With regard to the presence of other people in the household of study participants, five (12.5%) elderly individuals lived alone, 11 (27.5%) with their spouse, 23 (57.5%) with their family, and one (2.5%) with a partner. Corroborating these

results, a study performed in the same institution including 20 elderly individuals observed that ten (50%) elderly individuals lived with their family.<sup>9</sup>

The fact that elderly individuals live with their family can be a protective factor for them.<sup>15</sup> However, this study did not allow us to affirm whether elderly individuals live with their family because they need help or because the family depend on them financially, as many such individuals significantly contribute to the family expenses.

Regarding religion, 20 (50%) elderly individuals reported that they were Evangelicals, 13 (32.5%) were Catholic, three (7.5%) followed other religions (Umbanda, Spiritism, Rationalism), and four (10%) declared not to have a religion.

Religion and spirituality can help one to face events frequently considered to be stressors, such as the loss of loved ones, retirement (which has a negative connotation in many cases), the presence of chronic diseases and hospitalization, among others.<sup>16</sup>

Table 1 shows the socio-demographic characteristics of elderly individuals.

Regarding health problems found in the study population, 27 (67.5%) had arterial hypertension; 18 (45%), osteoarthritis; 14 (45%), cancer; 12 (30%), diabetes mellitus; 12 (30%), osteoporosis; 11 (27.5%), cardiovascular diseases; and seven (17.5%), chronic obstructive pulmonary disease (COPD), as shown on Graphic 1.

These data are similar to those found in another study performed in the same institution,<sup>9</sup> which found the following prevalent diseases: 15 elderly individuals (75%) with arterial hypertension, eight (40%) with *Diabetes Mellitus*, five (25%) with chronic respiratory diseases, and two (10%) with cardiovascular diseases.

The foot changes in the elderly included in this study and shown on Graphic 2 reveal frequency rates equal to or higher than 50% for foot skin dryness, found in 32 individuals (80%), decreased sensitivity in 30 (75%), presence of calluses in 27 (67.5%), cramps in 22 (55%), and *hallux valgus* in 20 (50%). During data collection, it should be emphasized that two male elderly individuals (12.5%) underwent a distal amputation of lower limbs due to complications caused by DM and peripheral obstructive arterial disease (POAD).

These results are higher than those obtained in a study performed with 50 elderly individuals in a Family Health Unit of a city in the countryside of the state of São Paulo,<sup>7</sup> which found that 38 (76%) elderly individuals had calluses, 29 (58%) had dry skin, 20 (40%) had decreased sensitivity, and ten (20%) had *hallux valgus*.

When associated with systemic diseases such as DM, peripheral vascular disease and peripheral neuropathy, foot diseases reduce one's ability to walk or even the action of standing up. However, foot problems such as *hallux valgus*, calluses, callosities, onycholysis and joint deformities that can cause pain and affect walking, frequent in the elderly population, can be treated and/or corrected, reducing instability and, consequently, the risk of falls.<sup>17,18</sup>

In the present study, when elderly individuals were asked whether they felt pain in their feet, 18 of them (75% of the total number of women) said "yes", while only four (25% of the total number of men) said "yes". However, when the Manchester Foot-Pain Disability Index was applied, foot pain was found to interfere with the daily routine of all elderly individuals. The overall mean for the Manchester Frailty Index between males and females was 20.1 points: women scored 21.5 points and men scored 17.9 points.

A study that included a survey on foot problems in elderly individuals living in a community in Australia using the MFPDI found a mean of 14 points, where women obtained higher scores, as observed in the present study. Additionally, among the foot changes, *hallux valgus* was also identified in 18 (17%) individuals.<sup>19</sup>

With the application of the Manchester Foot-Pain Disability index, we observed that, due to foot pains, more than 50% of elderly women avoided walking long distances, walking on rough or irregular surfaces, and standing for a long time, tending to feel irritated when their feet hurt and concerned about their feet and required footwear. In the group of men, more than 50% of elderly individuals avoided walking on rough and irregular surfaces, felt irritated when their feet hurt and were concerned about their feet and required footwear.

A prospective study that assessed foot pain and disability showed that the onset of such disability associated with foot pain was more frequently associated with the difficulty in walking long distances and standing up for a long time. This condition increased with age, especially among females.<sup>20</sup>

Women suffer from and report more foot problems than men. This can be attributed to the influence of footwear such as pointy shoes and high heels, thus increasing the chance of foot problems with age. Another aspect is resistance to pain. Women reported more pains than men and, consequently, sought health services more frequently.<sup>21</sup>

Additionally, the use of inadequate footwear is also common among elderly individuals as well as young adults. The younger population wears inadequate shoes due to fashion and beauty, to the detriment of comfort and safety and, in the long term, harming their feet. Unlike the younger population, elderly individuals tend to wear inadequate shoes, mainly because they seek comfort, despite the risk to safety. All elderly individuals in this study reported wearing flip-flops or low-heel sandals more frequently.

A study<sup>17</sup> found that the majority of elderly women had worn inadequate shoes throughout life and at present preferred flip-flops as they were more comfortable and practical. However, these should not be worn frequently, as they cannot support feet properly, thus leading to unstable posture and walking and being associated with an increase in the incidence of falls in this age group.

When elderly individuals were asked whether they used foot care services or not and the reasons why, two (5%) answered that they did so for beauty purposes and one, due to medical recommendation; eight (20%) said they did not use them

**Table 1.** Socio-demographic characteristics of hospitalized elderly individuals in a university hospital. Niterói, RJ, Brazil, 2016. (n = 40)

Variables	Men (16)		Women (24)		Total (40)	
	N	%	N	%	N	%
<b>Age</b>						
60 to 69	9	56.2	13	54.2	22	55
70 to 79	5	31.2	9	37.5	14	35
80 or more	2	12.5	2	8.3	4	10
<b>Marital status</b>						
Single	0	0	4	16.6	4	10
Married	12	75	6	25	18	45
Widowed	0	0	12	50	12	30
Divorced	3	18.7	0	0	3	7.5
Cohabiting	1	6.2	2	8.3	3	7.5
<b>Religion</b>						
Evangelical	7	43.7	13	54.2	20	50
Catholic	6	37.5	7	29.2	13	32.5
Others	1	6.3	2	8.3	3	7.5
Without a religion	2	12.5	2	8.3	4	10
<b>Level of education</b>						
Illiterate	3	18.7	1	4.1	4	10
Complete primary school	1	6.2	1	4.1	2	5
Incomplete primary school	4	25	14	58.3	18	45
Complete secondary school	8	50	8	33.3	16	40
<b>Income</b>						
Retired	12	75	12	50	24	60
Pension recipient	0	0	8	33.3	8	20
Self-employed	3	18.7	0	0	3	7.5
Without an income	1	6.3	4	16.7	5	12.5
<b>Other people in the household</b>						
Alone	1	6.2	4	16.6	5	12.5
Spouse	8	50	3	12.5	11	27.5
Family	6	37.5	17	70.8	23	57.5
Partner	1	6.2	0	0	1	2.5

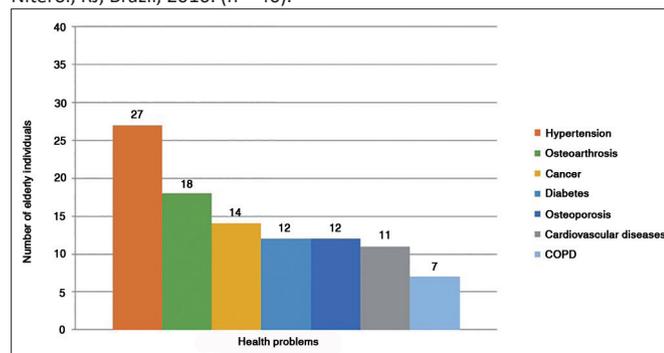
because they did not think such services were necessary and 21 (52.5%), due to lack of financial conditions; and eight (20%) reported not having knowledge about this topic.

These findings were also observed in another study,<sup>19</sup> which identified that a small proportion of the sample of elderly individuals sought foot care services (13%) and the most common reason was that they did not consider their foot problems to be severe enough. Additionally, questions of accessibility and financial conditions were also reported in a different study on self-care for feet among elderly individuals.<sup>22</sup>

In this context, the relevance of the gerontologist nurses and/or podiatrists as professionals participating in the public health team should be emphasized, in view of the fact that elderly individuals require professional help from foot health specialists and lack guaranteed access to foot care.<sup>10</sup>

Foot alterations are potentially changeable through prevention, treatment and rehabilitation. Thus, to provide such services for free can prevent complications that result in future costs due to the lack of care at the onset of these problems.<sup>7</sup>

**Graphic 1.** Distribution of study participants according to health problems. Niterói, RJ, Brazil, 2016. (n = 40).



Even with the prevalence of foot changes in elderly individuals and their harms to quality of life, these problems are rarely perceived, as many consider them to be inevitable conditions associated with the aging process.<sup>10</sup>

As the professionals responsible for the technical-scientific care, nurses must strengthen the bonds with these patients, performing a thorough physical examination that can elucidate the possible risks to the development of foot problems and also enable them to provide care at the onset of such problems, avoiding greater complications and reducing future care demands from these patients.

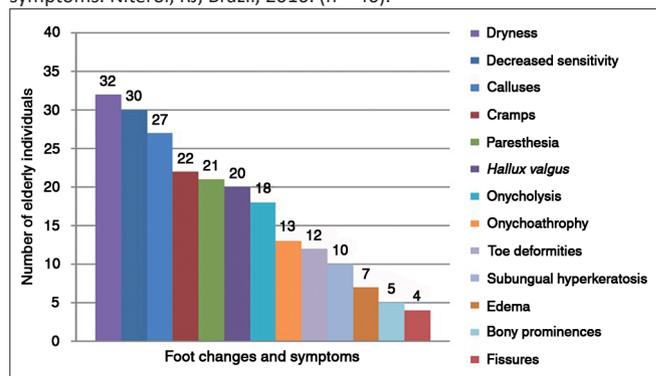
Inside and outside the hospital environment, a multi-disciplinary and inter-sectoral approach among the different professionals connected to public health can propose control and prevention tools. In this perspective, podiatric and/or gerontologist nurses could facilitate the development of educational booklets that can help elderly individuals' self-care for their feet and also the remaining health team members to be aware of the risks to the health and needs of such patients.

## CONCLUSION

The development of this study arose from the need to know the foot profile of the hospitalized elderly individuals to contribute to the health care strategies of nursing professionals, aiming to plan and implement educational strategies and tools such as booklets. The purpose is to incorporate a more critical perspective in health services so as to achieve comprehensiveness of health care for the demands of elderly individuals, in view of the aging process, onset of chronic diseases and risks to the integrity of their feet, which have direct repercussions on their autonomy, independence and functional capacity, with an increase in the incidence of falls among them.

It could be observed that all elderly participants had some type of foot change that interfered with their routine, posing risks that could aggravate diseases and restrictions to their mobility. Additionally, despite the frequency of such foot changes, many continued to follow incorrect practices such as the use of inadequate footwear, lack of skin hydration and the attempts to disguise their foot problems, delaying the search for treatment. This shows their lack of guidance on problems that affect their health and quality of life.

**Graphic 2.** Distribution of study participants according to foot changes and symptoms. Niterói, RJ, Brazil, 2016. (n = 40).



The relevance of a professional qualified for foot care in the area of gerontology should be emphasized, when a significant number of foot changes is observed. The relevance of elderly foot care is also confirmed through the reports on improvements in the quality of life of those who use a specialized service, as they were better instructed on self-care for their feet and reported a reduction in foot changes and pains.

Health promotion actions are required for this population in particular. Educational actions with instructions that reach this group's level of understanding can be effective. Moreover, being aware of the particularities of elderly individuals, nurses can play a key role in health teams, disseminating information and promoting more qualified health care that meets the health demands and needs of such patients.

Among the health care demands that need to be part of the multi-disciplinary and inter-sectoral debate about the actions of geriatric services is the feminization of aging and the alleged difficulty to search for free foot care services.

Furthermore, the need for a comprehensive approach to the elderly in health units should be emphasized, with the implementation of a program of instructions on self-care combined with strategies that promote changes in lifestyle and the adoption of healthy habits. This requires continuing support and guidance from health professionals, mainly from nurses, who play a key role in the planning and implementation of safe and individualized health care services, through a careful assessment performed in the perspective of disease prevention and health recovery and maintenance among the elderly.

While responsible for elderly care, nurses need to be qualified to identify their health demands, including foot care. As they are one of the participants involved in the health care process, nurses must approach the geriatric aspects in a holistic manner and promote self-care for their patients, through sensitive listening and scientific knowledge about the health of patients under their care.

Thus, other studies on this theme should be conducted, aiming to provide comprehensive and qualified health care for the needs and demands of the elderly in the perspective of health promotion, recovery and maintenance. The point of reference is an assessment based on principles of gerontology that reflect

on the preservation of autonomy, independence and functional capacity of elderly individuals in health institutions.

## REFERENCES

- Freitas EV, Py L. Tratado de Geriatria e Gerontologia. 3ª ed. Rio de Janeiro: Guanabara Koogan; 2012.
- Brasileiro de Geografia e Estatística (IBGE). Mudança Demográfica no Brasil no Início do Século XXI; 2015[cited 2016 Jul 02]. Available from: <http://biblioteca.ibge.gov.br/visualizacao/livros/liv93322.pdf>. ISBN 978-85-240-4344-4
- Bortoletto MSS, Viude DF, Haddad MCL, Karino ME. Caracterização dos portadores de diabetes submetidos à amputação de membros inferiores em Londrina, Estado do Paraná. *Acta Sci., Health Sci.* [Internet]. 2010[cited 2016 Jul 02];32(2):205-13. Available from: <http://periodicos.uem.br/ojs/index.php/ActaSciHealthSci/article/view/7754/7754>. ISSN 1807-8648. doi: <http://dx.doi.org/10.4025/actascihealthsci.v32i2.7754>
- Simão DAS, Lima EDRP, Souza RS, Faria TV, Azevedo GF. Síndrome mão-pé induzida por quimioterapia: relato de um caso. *Rev. Bras. Enferm.* [Internet]. 2012; [cited 2017 Jul 2];65(2):374-8. Available from: <http://www.scielo.br/pdf/rben/v65n2/v65n2a26.pdf>. ISSN 1984-0446. doi: <http://dx.doi.org/10.1590/S0034-71672012000200026>
- Ferrari SC, Santos FC, Araújo MSL, Cendoroglo MS, Trevisani VFM. Patologias no pé do idoso. *RBCEH, Rev. bras. ciênc. envelhecimento hum.* [Internet]. 2009 Jan-Abr [cited 2016 Jul 02];6(1):106-18. Available from: <http://www.upf.br/seer/index.php/rbceh/article/view/735/485>. ISSN 2317-6695. doi: <http://dx.doi.org/10.5335/rbceh.2012.735>
- Ferrari SC, Santos FC, Araújo MSL, Cendoroglo MS, Trevisani VSM. Índice Manchester de Incapacidade Associada ao Pé Doloroso no Idoso. *Rev. Bras. Reumatol.* [Internet]. 2008 [cited 2016 Jul 02];48(6):335-41. Available from: <http://www.scielo.br/pdf/rbr/v48n6/06.pdf>. ISSN 1809-4570. doi: <http://dx.doi.org/10.1590/S0482-5004200800600006>
- Marin MJS, Maciel MC. Caracterização dos problemas relacionados aos pés de idosos de uma comunidade em município do interior do Estado de São Paulo. *Rev. Bras. Geriatr. Gerontol.* [Internet]. 2014 [cited 2016 Jul 2]; 17(2):243-53. Available from: <http://www.scielo.br/pdf/rbgg/v17n2/1809-9823-rbgg-17-02-00243.pdf>. ISSN 1981-2256. doi: <http://dx.doi.org/10.1590/s1809-98232014000200003>
- Pinto MJ. Os pés do idoso e suas repercussões na qualidade de vida. In: Freitas EV, Py L. Tratado de Geriatria e Gerontologia. 3ª ed. Rio de Janeiro: Guanabara Koogan; 2012. P.1169-79.
- Oliveira TMJ. Interfaces do cuidado ao idoso hospitalizado: contribuições para a Enfermagem Gerontológica [monografia]. Niterói (RJ): Escola de Enfermagem Aurora de Afonso Costa, Universidade Federal Fluminense; 2014.
- Oliveira FMRLD, Barbosa KTF, Albuquerque SGED, Rodrigues MMD, Santos KFOD, Fernandes MDGM. Limitação funcional relacionada ao pé doloroso em idosos. *Rev Rene* [Internet]. 2015 Jul-Ago [cited 2016 Jul 02];16(4):586-92. Available from: <http://www.revistarene.ufc.br/revista/index.php/revista/article/viewFile/2068/pdf>. ISSN 1517-3852. doi: 10.15253/2175-6783.2015000400016
- Fernandes MTO, Soares SM. O desenvolvimento de políticas públicas de atenção ao idoso no Brasil. *Rev. Esc. Enferm. USP* [Internet]. 2012 [cited 2016 Jul 02]; 46(6):1494-502. Available from: [http://www.scielo.br/pdf/reeusp/v46n6/en\\_29.pdf](http://www.scielo.br/pdf/reeusp/v46n6/en_29.pdf). ISSN 0080-6234. doi: <http://dx.doi.org/10.1590/S0080-62342012000600029>
- Barbosa KTF, Albuquerque SGE, Fernandes MG, Fernandes MGM, Oliveira FMRL, Rodrigues MMD, et al. Alterações podais e mobilidade em idosos atendidos em um ambulatório de geriatria. *J res fundam care.* 2015 [cited 2016 Jul 2]; 7(2):2254-62. Available from: [http://www.seer.unirio.br/index.php/cuidadofundamental/article/viewFile/3628/pdf\\_1529](http://www.seer.unirio.br/index.php/cuidadofundamental/article/viewFile/3628/pdf_1529). ISSN 2175-5361. doi: 10.9789/2175-5361.2015.v7i2.2254-2262
- Pereira AS, Pinho AEP, Santos MÊS, Corrêa RGCF. Características, conhecimento e autocuidado de idosos portadores de Diabetes Mellitus com úlcera de pé. *Rev Pesq Saúde.* 2010;11(2):20-5. ISSN 2179-6238
- Lima-Costa MF, Barreto S, Giatti L, Uchôa E. Desigualdade social e saúde entre idosos brasileiros: um estudo baseado na Pesquisa Nacional por Amostra de Domicílios. *Cad. Saúde Pública* [Internet]. 2003 [cited 2016 Jul 02];19(3):745-57. Available from: <http://www.scielo.br/pdf/csp/v19n3/15878.pdf>. ISSN 1678-4464. doi: <http://dx.doi.org/10.1590/S0102-311X2003000300007>
- Nunes MCR, Ribeiro RCL, Rosado LEFPL, Franceschini SC. The influence of sociodemographic and epidemiological characteristics on the functional capacity of elderly residents in the city of Ubá, Minas Gerais. *Rev. Bras. Fisioter.* [Internet]. 2009 Set-Out [cited 2016 July 02];13(5):376-82. Available from: [http://www.scielo.br/pdf/rbfis/v13n5/en\\_aop053\\_09.pdf](http://www.scielo.br/pdf/rbfis/v13n5/en_aop053_09.pdf). ISSN 1413-3555. doi: <http://dx.doi.org/10.1590/S1413-35552009005000055>
- Duarte FM, Wanderley KS. Religião e Espiritualidade de Idosos Internados em uma Enfermaria Geriátrica. *Psicologia: Teoria e Pesquisa* [Internet]; 2011 Jan-Mar [cited 2016 Jul 02];2(1):49-53. Available from: <http://www.scielo.br/pdf/ptp/v27n1/a07v27n1.pdf>. ISSN 0102-3772. doi: <http://dx.doi.org/10.1590/S0102-37722011000100007>
- Mello BLD, Urano MM, Haddad MCL. Anormalidades Identificadas nos Pés de Idosos Institucionalizados. *UNOPAR Cient Ciênc Biol Saúde* [Internet]. 2014 [cited 2016 Jul 02];10(2):155-60. Available from: <http://pgsskroton.com.br/seer/index.php/JHealthSci/article/view/520/489>. ISSN 2447-8938. doi: <http://dx.doi.org/10.17921/2447-8938.2008v10n2p%25p>
- Barbosa MLJ, Nascimento EFA. Incidência de internações de idosos por motivo de quedas, em um hospital geral de Taubaté. *Rev biociênc* [Internet]. 2008 Jan-Jun [cited 2016 Jul 02];7(1):35-42. Available from: <http://periodicos.unitau.br/ojs-2.2/index.php/biociencias/article/viewFile/76/53>. ISSN 1415-7411
- Kaoulla P, Frescos N, Menz HB. A survey of foot problems in community-dwelling older Greek Australians. *Journal of Foot and Ankle Research* [Internet]. 2011 [cited 2016 Ago 18];4:23-9. Available from: [http://download.springer.com/static/pdf/119/art%253A10.1186%252F1757-1146-4-23.pdf?originUrl=http%3A%2F%2Ffootankleres.biomedcentral.com%2Farticle%2F10.1186%2F1757-1146-4-23&token2=exp=1479750411~acl=%2Fstatic%2Fpdf%2F119%2Fart%25253A10.1186%25252F1757-1146-4-23.pdf\\*~hmac=dd071157c316f91378cb73fbaff47935ce914a09d753ab2c828c623bc972f212](http://download.springer.com/static/pdf/119/art%253A10.1186%252F1757-1146-4-23.pdf?originUrl=http%3A%2F%2Ffootankleres.biomedcentral.com%2Farticle%2F10.1186%2F1757-1146-4-23&token2=exp=1479750411~acl=%2Fstatic%2Fpdf%2F119%2Fart%25253A10.1186%25252F1757-1146-4-23.pdf*~hmac=dd071157c316f91378cb73fbaff47935ce914a09d753ab2c828c623bc972f212). ISSN 1757-1146. doi: 10.1186/1757-1146-4-23
- Roddy E, Muller S, Thomas E. Onset and Persistence of Disabling Foot Pain in Community-Dwelling Older Adults Over a 3-Year Period: A Prospective Cohort Study. *Gerontol. A Biol. Sci. Med. Sci.* [Internet]. 2011[cited 2016 Ago 18];66(4):474-80. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3055276/pdf/gljq203.pdf>. ISSN 1758-535X. doi: 10.1093/gerona/gljq203
- Prato SCF, Santos FC, Trevisani VFM. Foot pain in the elderly associated to functional incapacity. *Rev dor* [Internet]. 2012 Jan-Mar [cited 2016 Jul 02];13(1):18-24. Available from: <http://repositorio.unifesp.br/bitstream/handle/11600/7012/S1806-00132012000100004.pdf?sequence=1&isAllowed=y>. ISSN 1806-0013. doi: <http://dx.doi.org/10.1590/S1806-00132012000100004>
- Stolt M, Suhonen R, Puukka P, Viitanen M, Voutilainen P, Leino-Kilpe H. Foot health and self-care activities of older people in home care. *J Clin Nurs.* 2012;21(21-22):3082-95. ISSN 1365-2702