



Changes to the feet of institutionalized elderly persons

352

Eidimara Ferreira¹
Marilene Rodrigues Portella²
Marlene Doring²

Abstract

Objective: The present study aimed to identify the most frequent changes to the feet of institutionalized elderly persons. *Method:* A descriptive study was conducted with elderly persons living in long-term care facilities in the city of Passo Fundo, Rio Grande do Sul, Brazil. A total of 174 people aged 60 years and over of both genders were surveyed regardless of health conditions. Those with amputations, burns or who were undergoing surgery of the lower limbs were excluded. Data were collected through the application of a structured questionnaire containing sociodemographic variables (age, gender, ethnicity, marital status, schooling, main occupation) and variables related to alterations of the feet (nail, dermatological and bone deformities). The Manchester Scale was subsequently applied to evaluate the degree of hallux deformity. *Results:* The most frequent nail deformities were onychomycosis, onychogryphosis, onycholysis, onychosclerosis; the dermatological findings were callosities, especially interdigital and bromhidrosis; the most prevalent bone deformities were pes cavus and transverse arches. In the assessment of hallux valgus, according to the Manchester Scale, painful feet (38.5%), mild deformities (35.6%) and no deformities (25.3%) were identified. *Conclusion:* The results suggest signs of neglect of the health of the feet of institutionalized elderly persons. There should be more investment in the training of teams responsible for care.

Keywords: Health evaluation. Podiatry. Homes for the Aged.

¹ Universidade de Passo Fundo, Instituto de Ciências Biológicas. Passo Fundo, RS, Brasil.

² Universidade de Passo Fundo, Programa Pós-Graduação Stricto Sensu em Envelhecimento Humano. Passo Fundo, RS, Brasil.

Research funding: Coordination for the Improvement of Higher Education Personnel/National Program of Academic Cooperation (CAPES/PROCAD). Call for proposals nº 071/2013. Agreement 2972/14, Research Project no. 88881.068447/2014-01.

INTRODUCTION

Aging is characterized as a continuous process of transformations experienced differently by each individual, as it is influenced by genetic inheritance, the lifestyle adopted over time, the environment, opportunities or inequalities in health, as well as anatomical, physiological and psychological changes¹. In the biological dimension, aging is a dynamic, progressive and physiological process, accompanied by morphological and functional modifications, among which are the anatomical and physiological structures of the feet².

The feet are parts of the body that, in addition to sustaining the entire bodily structure, are key to mobility, as it is through them that locomotion, balance and motility give individuals their locomotive independence. Chronic obstructive arterial diseases, vascular diseases and diabetes mellitus can make the elderly susceptible to podiatric complications^{2,3}.

Disorders of the feet, when they form part of the aging process, can be accompanied by a reduction in functionality and an increase in the degree of dependence on third parties for the performance of activities of daily living, which can be aggravated by the presence of chronic and disabling diseases. This causes health problems, including those that affect the structures of the locomotor apparatus such as bones, muscles, joints, nerves and tendons, which worsen in the presence of pain.

Studies have revealed a high prevalence of problems related to the health of the feet, associated with trauma that impairs the integrity of the nails, skin, nerves, vessels, and bone structures.^{4,5} Another important aspect is callosities and processes of pain, which can have psychological manifestations³.

Chronic diseases, such as diabetes and chronic obstructive arterial disease, can result in lower limb injuries, especially in the elderly. Problems with the feet lead to the deterioration of functional ability and interfere with mobility, increasing the risk of falls^{2,3}.

Considering the rapid growth of the elderly population and the increased demand for long-term care,¹ there is a trend to seek alternative services, including Long Term Care Facilities for

the Elderly (LTCF), although policies continue to prioritize the family as the providers of care for the elderly. As the current paradigm in health focuses on the maintenance of functional capacity and the promotion of quality of life, and given the importance of feet problems among the elderly, research aimed at this population group is required.

The present study therefore aimed to identify the most frequent changes to the feet of institutionalized elderly persons, in order to support improved care for the overall health of the elderly population.

METHOD

A descriptive study was performed with elderly people living in a LTCF in the town of Passo Fundo, Rio Grande do Sul, Brazil. A total of 174 people aged 60 and over of both genders, regardless of health conditions, participated from six institutions. The exclusion criteria of the study were: elderly persons hospitalized during the data collection period, with amputated limbs and/or a history of burns and/or recent surgical interventions in the feet. This research is part of a larger project entitled *Patterns of Aging and Longevity: Biological, Educational and Psychosocial Aspects*, which is part of the National Program for Academic Cooperation (PROCARD/CAPES, Applicationnº.71/2013).

Data collection was performed between October 2016 to May 2017 by a previously trained team and through the application of a structured questionnaire. The evaluation of the feet was performed by two nursing students under the supervision of the researcher. They were given specific training to identify the changes to the feet. The Manchester Scale was applied to check the degree of hallux valgus. This test was developed by Garrow et al.⁶, and uses a sheet with a photographic representation of four degrees of deformities (no deformity- 0 point, slight deformity-1 point, moderate deformity- 2 points, severe deformity- 3 points). The sheet is placed next to the right foot for comparison. This scale was translated and validated for Brazil by Esótico⁵.

Descriptive analysis of the data was carried out, considering the sociodemographic variables (age, gender, ethnicity, marital status, schooling, main

occupation) and variables related to alterations to the feet (nail, dermatological and bone deformities).

The ethical precepts that guide research involving human beings were respected, as set out in Resolution M^o 466/12 of the National Health Council. The participants and/or their caregivers signed a Free and Informed Consent Form. The project was approved by the Research Ethics Committee of the Universidade de Passo Fundo, under approval n^o. 2.097.278.

RESULTS

A total of 174 elderly people participated in the study, most of whom were women (62.6%) and white/Caucasian (83.3%). Age ranged from 60 to 101 years, with a mean of 80.5 (\pm 9.4) years. In terms of marital status, 55.2% were widowers and 21.3% were single; 67.8% had one to eight years of schooling, and the most frequently described previous occupation was homemaker (23.0%), followed by agriculture (20.1%) (Table 1).

Table 1. Sociodemographic characteristics of the institutionalized elderly persons (N=174). Passo Fundo, RS, 2017.

Variables	n (%)
Gender	
Female	109 (62.6)
Male	65 (37.4)
Age range (years)	
60–69	25 (14.4)
70–79	52 (30.1)
≥80	96 (55.5)
Skin color/ethnicity	
White/Caucasian	145 (85.8)
Black/Afro-Brazilian	9 (5.3)
Brown/Mixed-Race	13 (7.7)
Yellow/Asian-Brazilian	2 (1.2)
Marital status	
Married	13 (7.4)
Single	37 (21.3)
Divorced/Separated	28 (16.1)
Widowed	96 (55.2)
Schooling (years of study)	
Illiterate	32 (18.7)
1 to 8	118 (69.0)
≥9	21 (12.3)
Previous occupation	
Homemaker	40 (23.0)
Agricultural worker	35 (20.1)
Teacher	15 (8.6)
Domestic worker/Cleaner	10 (5.7)
Seamstress	6 (3.4)
Builder	5 (2.9)
Driver	4 (2.3)
Others*	59 (34.0)

*Occupations with frequency <4

Onychomycosis (70.7%), onychogryphosis (43.1%), onycholysis (39.0%) and onychosclerosis (36.2%) were the most frequent changes to the feet of the elderly (Table 2). Regarding dermatological alterations, there was a prevalence of interdigital

callosity (23.6%), and bromhidrosis/fetid odor (21.3%). The most frequent bone deformities were pes cavus (56.3%) and in the transverse arches (54.6%). Foot hygiene was evaluated as satisfactory in most cases (64.9%).

Table 2. Distribution of foot disorders in institutionalized elderly persons (N= 174). Passo Fundo, Rio Grande do Sul, 2017.

Alterations	n (%)
Ungual alterations	
Onychomycosis	123 (70.7)
Onychogryphosis	75 (43.1)
Onycholysis	68 (39.0)
Onychosclerosis	63 (36.2)
Onychatrophia	34 (19.5)
Nail psoriasis	34 (19.5)
Onychodystrophy	30 (17.2)
Leukonychia	30 (17.2)
Dermatological alterations	
Interdigital callosity	41 (23.6)
Bromhidrosis/Fetid odor	37 (21.3)
Anhidrosis	34 (19.5)
Callosity in the toes	30 (17.2)
Dyshidrosis	26 (14.9)
Tinea pedis	21 (12.1)
Plantar callus	18 (10.3)
Milliare callus	11 (6.3)
Cleft	10 (5.7)
Bone deformities	
Pes cavus	98 (56.3)
Transverse arch	95 (54.6)
Medial arch	76 (43.7)
Lateral arch	45 (25.9)
Pes valgus/Pronatus	50 (28.7)
Pes varus/Supinated	49 (28.2)
Flat foot	48 (27.6)
Hallux valgus/bunion	109(62.6)
Claw toe	98 (56.3)
Satisfactory hygiene	113 (64.9)

In terms of foot problems (Table 3), when evaluated by the Manchester Scale, 38.5% of the elderly persons had foot pain, while mild was the

most frequent type of deformity of the hallux valgus, followed by no deformity and moderate deformity. A notable percentage (17.2%) had severe deformities.

Table 3. Distribution of foot problems in institutionalized elderly people based on the Manchester Scale. Passo Fundo, Rio Grande do Sul, 2017.

Disorders	n (%)
Foot pain	
Yes	67 (38.5)
Hallux valgus	
No deformity	44 (25.3)
Light deformity	62 (35.6)
Moderate deformity	38 (21.9)
Severe deformity	30 (17.2)

DISCUSSION

The sociodemographic profile of the institutionalized elderly, where women with a mean age of 80.5 years predominated, and the nail disorders found corroborate the results of a study carried out in São Bernardo do Campo in the state of São Paulo⁷, which identified a mean age of institutionalized elderly persons of 86 years among both genders. Onychomycosis was the most frequent disorder, a significant finding in terms of nail disorders, identifying a high rate of fungal alterations in the feet of the institutionalized elderly, exceeding the results found in other studies carried out in Brazil^{8,9}.

Among factors that contribute to the increase of onychomycosis in the feet, the use of closed shoes and socks for prolonged periods of time, irrespective of the season, can cause disease of the nail bed and subsequent invasion to the nail plate. This suggests a need for care and guidance for caregivers and the elderly themselves regarding foot care for this and the other pathologies identified, even if not prevalent^{3,10,11}.

Problems such as onychogryphosis and onycholysis were recorded in almost half the population of the present study. For onychogryphosis, or ram's horn nails, studies show a prevalence of 43.1% in the elderly. In the aging process, the nails become curved and

generally grow faster¹⁰, causing the nail plate of the elderly persons to modify its chemical composition, raising the calcium content and reducing the iron content. As a consequence, the lamina becomes fragile, brittle and with deep grooves (longitudinal striae), leading to onychogryphosis¹¹.

About one-third of the elderly studied had onycholysis, that is, nail detachment, corroborating the study of this condition performed with non-institutionalized elderly residents in the city of Porto Alegre (Rio Grande do Sul)¹². This alteration may be related to trauma, dehydration of the skin, the presence of moisture in the feet and vascular disorders¹³. It is a frequent nail disorder in the elderly, resulting from microtraumas and the improper use of footwear^{3,7,14}.

However, this nail disorder may be related to conditions of frequent morbidities among the elderly, such as low immunity, hypertension, diabetes mellitus or even inadequate hygiene, where bromhidrosis is a contributing factor and onycholysis a secondary factor^{4,7}, making therapeutic management difficult and consequently compromising quality of life.

Regarding the dermatological disorders observed in this study, interdigital callosity was present in a quarter of the elderly. In a study that aimed to assess the characteristics of the feet problems of 50

elderly persons belonging to a Family Health Unit, the majority of whom were female, a prevalence of 76.0% was identified. These were callosities that occur in bony prominence areas after a long period of pressure and friction, which can cause pain and difficulty with gait¹⁵.

The study by Mello and Haddad¹⁶, on the foot conditions of a population of 784 elderly persons, found 58.2% with problems of corns and calluses. Calluses in the elderly cause difficulty in functional capacity and interfere with the basic activities of daily living, such as walking, and also hinder hygiene. A survey carried out in a university hospital located in the state of Rio de Janeiro¹¹ found the presence of callosities in 67.5% of the elderly population. It is worth noting that as well as the physiological and anatomical causes, other factors also contribute to the development of callosities on the feet.

Among the bone deformities, the prevalence of pes cavus was higher than in the results of a survey carried out in the state of São Paulo⁵, in which the frequency was 20.0%. The findings of the present study also contradicted those of the study by Peral et al.¹² in which 9.41% had pes cavus.

Toe deformities are common among the elderly, with assessment by the Manchester scale revealing that one-third of the elderly assessed had pain in the feet and mild deformities. These results are corroborated by a study that evaluated the elderly using the same scale¹⁸. Foot pain in the elderly is often associated with functional incapacity^{2,11,13}. Foot deformities may be perceived by elderly persons as a common deformity in aging. However, they can cause health impairment, such as decreased strength, coordination, increased postural instability, risk of falls, functional disability and a consequent reduction in quality of life^{11,13,17,18}.

The presence of onychopathies and deformities in the feet can cause behavioral changes and impair the emotional state of the elderly person. Manifestations such as anxiety and fear are psychological factors that diminish confidence in one's ability to walk and are a potential risk of falls, which therefore affects the functional mobility of the institutionalized person, justifying investment in the care of foot disorders.

Difficulties were reported by team members at the long-term care facilities¹⁹, such as a need for knowledge about caring for the elderly, particularly in podiatry, suggesting the need for improvement in treatment and continuous education programs, as care for food disorders is not always included in the overall training of professionals in the area of health.

Caring for an elderly person, regardless of the context, demands a combination of knowledge, skills and attitudes that support the activity of caring, which functions throughout the education and training process of the caregivers present in the services, especially in the establishment of care protocols. This requires the implementation of programs focused on caregivers, involving both health services and social facilities, such as LTCFs. It also highlights the importance of the participation of a multi-professional team in educational actions and the need for the inclusion of podiatrists in health services, something that is rare in the context of elderly care, but which is justified by the benefits of interconnected knowledge.

The present study has some limitations, namely in terms of its delineation, which generally aims to describe populations according to the attributes of the individual, time and space, without the objective of establishing associations or causal inferences, which limits the possibility of extrapolation to the wider institutionalized elderly population.

CONCLUSION

The present study allowed the identification of feet disorders in institutionalized elderly persons. The findings showed that the most frequent were those related to the nails, such as onychomycosis, onychogryphosis and onycholysis. The main dermatological problems were callosities and bromhidrosis while the most common bone deformities were pes cavus and those of the transverse arcs.

The most prevalent degrees of hallux valgus deformity indicated by the Manchester Scale were mild and no deformity. Most of the elderly persons reported pain in their feet.

Based on the results of this study, greater attention to the health of the feet of the institutionalized elderly is required among health professionals and caregivers.

This in turn requires specific training, aimed at the prevention of these disorders and improvement in the quality of life of this population.

REFERENCES

- World Health Organization. Relatório mundial de envelhecimento e saúde [Internet]. Genebra: WHO; 2015 [acesso 17 mar. 2017]. Disponível em: <http://sbgg.org.br/wpcontent/uploads/2015/10/OMS-ENVELHECIMENTO-2015-port.pdf>
- Martínez-Gallardo PL, Hermida LF, D'hiver C. Prevalencia de patología del pie en una población Geriátrica y su impacto en la función, la marcha y el síndrome de caídas. *Rev Esp Geriatr Gerontol* [Internet]. 2012 [acesso 13 abr. 2018];47(1):19-22 Disponível em: <http://www.elsevier.es/es-revista-revista-espanola-geriatria-gerontologia-124-articulo-prevalencia-patologia-del-pie-una-S0211139X11001739>
- González RY, Zenteno LMA, Hernández AJa, Báez Hernández FJ, Tamariz RA. Prevalencia de enfermedades podológicas en el adulto mayor de un albergue público. *Rev Cubana Invest Bioméd* [Internet] 2016 [acesso em 12 abr. 2018];35(4):331-40. Disponível em: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-03002016000400004&lng=es
- López LD, Rodríguez SD, Morales PA, Soriano MA. Aproximación al manejo de la patología micótica en el pie. *Rev Int Cienc Podol* [Internet]. 2015 [acesso em 14 abr. 2018];9(1):24-36. Disponível em: <http://revistas.ucm.es/index.php/RICP/article/view/47314/44364>
- Esotico APC. A Avaliação dos problemas podais de idosos e sua relação com a mobilidade funcional e o equilíbrio [Dissertação]. São Paulo: Faculdade de Ciências Médicas; 2009.
- Garrow AP, Papageorgiou A, Silman AJ, Thomas E, Jayson MIV, Macfarlane GJ. The grading of hallux valgus: The Manchester Scale. *J Am Pod Med Assoc*. 2001;91(2):74-8.
- Vasconcellos C, Pereira CQM, Souza MC, Freitas RS, Pelegrani A, Takahashi PJ. Identificação de espécies fúngicas nas onicomicoses do idoso institucionalizado. *An Bras Dermatol*. 2013;88(3):377-80.
- Silva L, Oliveira DB, da Silva BV, de Souza RA, da Silva PR, Ferreira-Paim K, et al. Identification and antifungal susceptibility of fungi isolated from dermatomycoses. *J Eur Acad Dermatol Venereol* [Internet]. 2014 [acesso 20 mar. 2017];28(5):633-40. Disponível em: <https://www.ncbi.nlm.nih.gov/pubmed/23556501>
- Araiza-Santibáñez J, Tirado-Sánchez AL, González-Rodríguez L, Vázquez-Escorcia RM, Ponce-Olivera A, Bonifaz A. Onychomycosis in the elderly: A 2-year retrospective study of 138 cases. *Rev Méd Hosp Gen Méx* [Internet]. 2016 [acesso 17 fev. 2017];79(1):5-10. Disponível em: <https://www.sciencedirect.com/science/article/pii/S018510631500089X>
- Prato SCF, Santos FC, Trevisani VFM. Pé doloroso do idoso associado à incapacidade funcional. *Rev Dor*. 2012;13(1):18-24.
- 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*. 2014;17(2):243-53.
- Peral ATR, Mariano FC, dos Reis MC, Silveira MF. Principais patologias que acometem os pés de idosos no processo de envelhecimento. *Rev Digit Podol* [Internet]. 2016 [acesso 20 mar. 2017];1(66):23-35. Disponível em: http://www.revistapodologia.com/jdownloads/Revista%20Digital%20Gratuita%20Portugues/revistapodologia.com_066pt.pdf
- Vázquez-Navarrete I, Olivares-Luna AM, González-Pedraza AA. Podiatric disorders, risk of falls and pain in the elderly. *Aten Fam* [Internet]. 2016 [acesso em 13 mar. 2018];23(2):39-42. Disponível em: <http://www.sciencedirect.com/journal/atencion-familiar/vol/23/issue/2>
- Brasil. Resolução nº 466, de 12 de dezembro de 2012. Aprova diretrizes e normas regulamentadoras de pesquisa envolvendo seres humanos. 2013. Saúde Legis. Disponível em: http://bvsms.saude.gov.br/bvs/saudelegis/cns/2013/res0466_12_12_2012.html
- Borreiros FS, Romero Soto M, Manso PG, Fernández AM, Coteló MCS, Castiñeira MMM. Hábitos de cuidados podológicos en personas mayores de 65 años. *El Peu* [Internet]. 2010 [acesso 13 abr. 2018];30(1):36-41. Disponível em: https://www.researchgate.net/publication/270959307_Habitos_de_cuidados_podologicos_en_personas_mayores_de_65_anos
- de Mello BLD, Haddad MCL. Anormalidades identificadas nos pés de idosos. *J Health Sci* [Internet]. 2014 [acesso em 19 jun. 2016];16(20):155-60. Disponível em: <http://www.pgsskroton.com.br/seer/index.php/JHealthSci/article/view/520/489>

17. Silva JS, Santo FHE, Chibante CLP. Alterações nos pés do idoso hospitalizado: um olhar cuidadoso da enfermagem. Esc Anna Nery Ver Enferm [Internet]. 2017 [acesso em 16 Abr. 2018];21(1):1-7. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1414-81452017000100210&lng=en
18. Barbosa KTF, Albuquerque SGE, Fernandes MG, de Oliveira FMRL, Rodrigues MMD, Fernandes AM. Alterações podais e mobilidade em idosos atendidos em um ambulatório de geriatria. J Res Fundam Care Online [Internet]. 2015 [acesso em 16 abr. 2018];7(2):2254-62. Disponível em: http://www.redalyc.org/articulo.oa?id=505750946006_2
19. Silva MP, Falcão DVS. Cuidar de Idosos numa ILPI na Perspectiva de Cuidadoras Formais. Rev Kairós [Internet] 2014 [acesso 12 abr. 2018];17(3):111-31. Disponível em: <https://revistas.pucsp.br/index.php/kairós/article/view/21774>

Received: October 31, 2017

Reviewed: March 24, 2018

Accepted: May 14, 2018