

## ORIGINAL ARTICLE

## PHYSICAL FRAILTY AND URINARY INCONTINENCE OF ELDERLY IN AMBULATORY CARE

Maria Helena Lenardt<sup>1</sup>, Dayana Cristina Moraes<sup>2</sup>, Clarice Maria Setlik<sup>3</sup>, Larissa Sayuri Setoguchi<sup>4</sup>, Bruno Henrique de Mello<sup>5</sup>, Gabriella Mariani Vidal Frohlich<sup>6</sup>

### ABSTRACT

**Objective:** To analyze the association of markers and physical frailty condition with urinary incontinence in outpatient geriatric and gerontological care.

**Method:** A cross-sectional study, developed in the secondary health care of an outpatient clinic of Paraná, with 384 elderly. Data were collected between September 2016 and March 2017 through frailty phenotype and the questionnaire International Consultation on Incontinence Questionnaire - Short Form.

**Results:** of the elderly 118 (30.7%) were considered non-frail, 212 (55.2%) pre-frail, 54 (14.1%) frail, 106 (27.6%) with urinary incontinence, 50 (47.2 %) with very severe impact on daily routine, 18 (17.0%) severe, 16 (15.0%) moderate, 11 (10.4%) mild to no impact. Urinary incontinence was associated with the condition of frailty ( $p=0.011$ ), the markers for decreased handgrip strength ( $p=0.027$ ), fatigue and exhaustion ( $p=0.002$ ) and reduced gait speed ( $p=0.000$ ).

**Conclusion:** The results contribute to the critical development of nursing when assessing the needs of gerontological care.


**DESCRIPTORS:** Elderly; Frailty; Frail Elder; Bladder Incontinence Geriatric Nursing.


### HOW TO REFERENCE THIS ARTICLE:


Lenardt MH, Moraes DC, Setlik CM, Setoguchi LS, Mello BH de, Frohlich GMV. Physical frailty and urinary incontinence of elderly in ambulatory care. *Cogitare enferm.* [Internet]. 2020 [access "insert day, month and year"]; 25. Available at: <http://dx.doi.org/10.5380/ce.v25i0.67077>.





This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).


<sup>1</sup>Nurse. PhD in Nursing. Professor at the Federal University of Paraná. Curitiba, PR, Brazil. 

<sup>2</sup>Nurse. Master in Nursing. Federal University of Paraná. Curitiba, PR, Brazil. 

<sup>3</sup>Nurse. Master student in Nursing. Federal University of Paraná. Curitiba, PR, Brazil. 

<sup>4</sup>Nurse. Master in Nursing. Federal University of Paraná. Curitiba, PR, Brazil. 

<sup>5</sup>Nurse. Master in Nursing. Federal University of Paraná. Curitiba, PR, Brazil. 

<sup>6</sup>Nursing Student. Federal University of Paraná. Curitiba, PR, Brazil. 

## FRAGILIDADE FÍSICA E INCONTINÊNCIA URINÁRIA DE IDOSOS EM ASSISTÊNCIA AMBULATORIAL

### RESUMO

*Objetivo:* analisar a associação dos marcadores e da condição de fragilidade física à incontinência urinária em assistência ambulatorial de geriatria e gerontologia.

*Método:* estudo transversal, desenvolvido na atenção secundária à saúde de ambulatório do Paraná, com 384 idosos. Coletaram-se dados entre setembro de 2016 a março de 2017 mediante fenótipo de fragilidade e questionário International Consultation on Incontinence Questionnaire - Short Form.

*Resultados:* dos idosos 118 (30,7%) foram considerados não frágeis, 212 (55,2%) pré-frágeis, 54 (14,1%) frágeis, 106 (27,6%) com incontinência urinária, 50 (47,2%) com impacto muito grave na rotina diária, 18 (17,0%) grave, 16 (15,0%) moderado, 11 (10,4%) leve a nenhum impacto. Associaram-se à incontinência urinária a condição de fragilidade ( $p=0,011$ ), os marcadores força de preensão manual diminuída ( $p=0,027$ ), fadiga e exaustão ( $p=0,002$ ) e velocidade da marcha reduzida ( $p=0,000$ ).

*Conclusão:* os resultados contribuem com o desenvolvimento crítico da enfermagem no momento de avaliar as necessidades de cuidado gerontológico.

**DESCRITORES:** Idoso; Fragilidade; Idoso Fragilizado; Incontinência Urinária; Enfermagem Geriátrica.

## FRAGILIDAD FÍSICA E INCONTINENCIA URINARIA DE ADULTOS MAYORES EN ATENCIÓN AMBULATORIA

### RESUMEN

*Objetivo:* analizar la asociación de los marcadores y la condición de fragilidad física a la incontinencia urinaria en la atención ambulatoria en geriatría y gerontología.

*Método:* estudio transversal, desarrollado en atención secundaria ambulatoria de salud del estado de Paraná (Brasil), con 384 ancianos. La recolección de datos se realizó entre septiembre de 2016 y marzo de 2017, mediante fenotipo de fragilidad y cuestionario International Consultation on Incontinence Questionnaire - Short Form.

*Resultados:* 118 (30,7%) ancianos se consideraron no débiles, 212 (55,2%) pre débiles, 54 (14,1%) débiles, 106 (27,6%) con incontinencia urinaria, 50 (47,2%) con impacto muy grave en la rutina diaria, 18 (17,0%) con impacto grave, 16 (15,0%) con impacto moderado, 11 (10,4%) con leve o ningún impacto. Se asociaron a la incontinencia la condición de fragilidad ( $p=0,011$ ), los marcadores fuerza de sujeción manual disminuida ( $p=0,027$ ), fatiga y agotamiento ( $p=0,002$ ) y velocidad da marcha reducida ( $p=0,000$ ).

*Conclusión:* los resultados contribuyen al desarrollo crítico de la enfermería al momento de evaluar las necesidades de cuidado gerontológico.

**DESCRIPTORES:** Adultos Mayores; Fragilidad; Anciano Debilitado; Incontinencia Urinaria; Enfermería Geriátrica.

## INTRODUCTION

Physical frailty and geriatric syndromes represent a group of clinical changes associated with human aging that can lead to disabling situations, since they affect the autonomy, functionality and well-being of the elderly. Physical frailty is defined as a "medical syndrome with multiple causes and contributions, characterized by decreased strength, endurance and reduced physiological function, which increases an individual's vulnerability to develop greater dependence and/or death"<sup>(1:13)</sup>. Due to these exposures, it is considered one of the most relevant geriatric conditions and, consequently, studies are intensified in the national and international context.

To assess and diagnose physical frailty, a phenotype consisting of five measurable biological markers is suggested: Unintentional weight loss, self-reported fatigue/exhaustion, reduced gait speed, decreased level of physical activity and handgrip strength. Those who show a decline in three or more markers are considered frail elderly, those who show this deficit in one or two items are pre-frail and non-frail elderly are those who show no changes in any of the evaluated components<sup>(2)</sup>.

In their turn, geriatric syndromes are defined by several health factors, which occur when the accumulated effects of deficiencies in multiple organism systems make the elderly vulnerable to daily attitudes and behaviors. Vulnerability condition may favor falling events, comorbidities, incontinence, and pain<sup>(3)</sup>. The treatment and care of these consequences are a major challenge for the health system, especially for nursing care.

Among the geriatric syndromes, sphincter incontinence, classified as urinary and fecal incontinence, is one of the biggest problems faced by the elderly population, with great repercussion on quality of life, independence and autonomy. Urinary incontinence (UI) in the elderly, focus of this article, produces numerous medical, psychological, socioeconomic problems and, as a consequence, establishes difficulties for the routine of basic activities of daily living<sup>(4)</sup>. It is an important and recurrent syndrome among the elderly and can present itself as an isolated health condition, regardless on the presence of frailty<sup>(5)</sup>.

Urinary incontinence is defined as "complaining of any involuntary loss of urine and should not be interpreted as a natural part of aging"<sup>(6)</sup>. Still, several factors need to be considered to achieve the effective diagnosis of UI, not just those linked to the genitourinary tract. The nurse's assessment on the UI should understand the social function, since it is the health domain most often affected, surpassing physical function. However, physical frailty may be associated, which leads the elderly to a distressing and disabling condition.

The study is considered relevant for nursing, since UI and physical frailty are subject to treatment, care and prevention. Early identification of geriatric syndromes and their relationships by nurses strengthens preventive measures and contributes to the reduction of the process of frailty in the elderly. These measures reduce the impact of unsuccessful aging on health services and society at large.

Given the above, the objective of the present study was to analyze the association between markers and the condition of physical frailty to urinary incontinence of elderly in outpatient geriatric and gerontological care.

## METHOD

A quantitative cross-sectional study, developed at the Geriatrics and Gerontology Outpatient Clinic (GGOC), in São José dos Pinhais-PR (Brazil). The target population corresponded to the elderly aged  $\geq 60$  years old referred from primary health care, scheduled for consultation at the GGOC.

To define a representative sample of the population, we considered the total elderly population of São José dos Pinhais in 2015<sup>(7)</sup>. The sample size included an 8% margin for possible loss or refusal, resulting in a final sample of 411 elderly. Of this total, one elderly refused to participate and 26 were eliminated by the exclusion criteria. Therefore, the sample consisted of 384 elderly.

Recruitment of participants was voluntary, all older people were invited to participate in the research through posters at the clinic and in person while waiting for consultation at the GGOC.

For the selection of the elderly, the following inclusion criteria were adopted: Age  $\geq 60$  years old attending the scheduled consultation at GGOC; having cognitive ability to perform the tests, as a result of the Mental State Mini-Exam (MSME)<sup>(8)</sup>.

Exclusion criteria were detected by medical records and/or during medical consultation: Presenting severe sequelae of stroke, with localized loss of muscle strength and aphasia; having neurological diseases that prevent testing; having severe hearing or vision deficits that make communication difficult; physically unable to perform the proposed tests.

In order to standardize the collections, training was conducted for the support group, which was coordinated by the researchers of the research group. Also, a pilot study was conducted with ten elderly, with the purpose of verifying and adjusting the data collection instruments. Participants were included in the final study sample, as there was no need for changes in the tested instruments. Data collection took place from September 2016 to March 2017.

The MSME<sup>(8)</sup> was used for tracking the cognitive changes. The total MSME score is zero to thirty, and the following cutoff points are adopted: 13 points for illiterate elderly; 18 points for those with low and medium education (one to eight incomplete years of schooling) and 26 points for high education (eight or more years of schooling)<sup>(9)</sup>.

In the collection of sociodemographic data, in order to characterize the sample, we used a structured questionnaire with closed questions and consisting of the following variables of interest: Gender, marital status, age, education, race and monthly family income. These variables were adapted from the model of the Brazilian Institute of Geography and Statistics<sup>(10)</sup>.

Physical frailty was assessed by the frailty phenotype<sup>(2)</sup>. Handgrip strength (HGS) marker was measured in kilogram/force (kgf), with a Jamar® brand hydraulic dynamometer, and followed the recommendation of the American Society of Hand Therapists (ASHT)<sup>(11)</sup>. The elderly performed three grips, always interspersed for one minute to return the force, and then recorded the three values. For each elderly, the HGS values were adjusted according to gender and Body Mass Index (BMI). The values that included the lowest quintile were considered markers of frailty<sup>(2)</sup>.

To assess gait speed (m/s), the elderly were instructed to walk a 6.6 meter path, usually on a flat surface, signaled by two adhesive tapes. To reduce acceleration and deceleration effects, the first and last meters of the walk were not timed. After adjusting for gender and height, values in the smallest quintile were considered frailty markers<sup>(2)</sup>.

Unintentional weight loss was verified by self-report of the elderly in answer to two questions: (1) "Have you lost weight in recent months?" (2) "How many kilos?" The elderly who reported unintentional weight loss of 4.5 kg or more in the last 12 months were considered frail for this marker<sup>(2)</sup>.

Fatigue/exhaustion was assessed by self-report, according to the participant's response to items 7 and 20 of the depression scale Center for Epidemiological Scale - Depression (CES-D), validated for Brazilian elderly from the community<sup>(12)</sup>. Answer "2" or "3" for any of the questions categorized the elderly as frail for this marker<sup>(2)</sup>.

For the physical activity level marker, the questionnaire Minnesota Leisure Activity Questionnaire was applied, validated for Brazilian elderly<sup>(13)</sup>. The questions consider the frequency and timing of activities performed in the last year. The annual energy expenditure of each elderly person was calculated. After adjusting for gender, values in the smallest quintile were considered markers for frailty<sup>(2)</sup>.

Urinary incontinence was assessed by the International Consultation on Incontinence Questionnaire - Short Form (ICIQ-SF), translated and validated in Brazil<sup>(14)</sup>. This questionnaire quickly assesses the impact of urinary incontinence on quality of life in four questions and qualifies the urinary loss of patients of both sexes<sup>(14)</sup>.

The data were organized and coded in the program Microsoft Excel® 2007, and analyzed in the statistic program SPSS in version 2.2, through descriptive statistics. Univariate analyzes were performed by the Chi-square test, considering the level of statistical significance  $p \leq 0,05$ .

The research project was approved by the Human Research Ethics Committee of the Health Sciences Sector, of the institution to which the researchers belong, under opinion No. 1.755.394.

## RESULTS

The sample consisted of 384 elderly with a mean age of 70.7 years old, minimum of 60 years old and maximum of 100 years old. Older people from rural areas predominated, with one to four years of schooling 208 (54.2%), married 253 (65.9%), white 313 (81.5%) and family income of up to two minimum wages 331 (86.2%).

The distribution of physical frailty was 118 (30.7%) non-frail elderly, 212 (55.2%) pre-frail elderly, and 54 (14.1%) frail elderly. Urinary incontinence was reported by 106 (27.6%). Of these, 50 (47.2%) reported a very severe UI impact on their daily routine, 18 (17%) reported severe impact, 16 (15%) moderate impact, 11 (10.4%) mild impact, and 11 (10.4%) no impact.

Some features of urine loss stand out: Twice a week ( $n = 31$ ; 8.1%), small amount of urine ( $n=67$ ; 17.4%) before reaching the bathroom ( $n=62$ ; 16.1%) when coughing or sneezing ( $n=35$ ; 9.1%) and sleeping ( $n=21$ ; 5.5%). The percentages exceed 100%, because check boxes were used, i.e., the elderly selected multiple response options from the list.

Table 1 shows the distribution of the condition of physical frailty and urinary incontinence, of the 54 frail elderly, 22 (40.7%) have UI. Urinary incontinence was associated with the condition of frail elderly ( $p=0.011$ ).

Table 1 - Association between physical frailty condition and urinary incontinence in the elderly. Curitiba, PR, Brazil, 2018

Physical frailty	Urinary incontinence		Total n (%)	p-value*
	Yes n (%)	No n (%)		
Frail	22(40.7)	32(59.3)	54(100)	0.011*
Pre-frail	54(25.5)	158(74.5)	212(100)	0.052
Non-frail	30(25.4)	88(74.6)	118(100)	>0.05

\* Chi-square test; \*p-value <0.05

Table 2 shows that urinary incontinence was associated with physical frailty markers: Decreased handgrip strength ( $p=0,027$ ), fatigue/exhaust ( $p=0.002$ ) and reduced gait speed ( $p=0.000$ ). The prevalence of incontinent elderly for these markers was 36.2%, 38.4% and 44.2%, respectively.

Table 2 - Association between physical frailty markers and urinary incontinence in the elderly. Curitiba, PR, Brazil, 2018

Physical frailty markers	Urinary incontinence		Total n (%)	p-value*
	Yes n (%)	No n (%)		
Decreased handgrip strength	29(36.2)	51(63.8)	80(100)	0.027*
Fatigue/exhaustion	38(38.4)	61(61.6)	99(100)	0.002*
Reduced gait speed	34(44.2)	43(55.8)	77(100)	0.000*
Unintentional weight loss	15(27.8)	39(72.2)	54(100)	0.827
Reduction of physical activity level	37(24.6)	114(75.4)	151(100)	0.462

\* Chi-square test; \*p-value <0.05

## DISCUSSION

The high condition of physical pre-frailty of the elderly, observed in more than half of the sample is highlighted. This is a worrying condition due to the lack of knowledge about the pre-frailty evolution time, and especially when not treated by the recommendations<sup>(1)</sup> of physical frailty care management.

Observational epidemiological investigation conducted with 1,716 elderly ( $\geq 60$  years) in the city of Curitiba-PR corroborates with the present study, since the prevalence of pre-frailty of the study was high with predominance of the majority of the (65.3%) pre-frailty sample<sup>(15)</sup>. Pre-frailty is also high in countries such as the United States, where it affects 47% of the elderly<sup>(2)</sup> and in China (Shanghai) totalized 41.7%<sup>(16)</sup>. In Brazil, data from the Brazilian Elderly Frailty Study (BEFS) show that 51% of the elderly are in the condition of pre-frailty<sup>(17)</sup>.

Regarding the distribution of urinary incontinence, the values found in some national and international data differ from the present study, although justified by the characteristics of the sample. Researchers from the population-based study conducted in Korea investigated 6,185 elderly men (60-64 years) to analyze UI prevalence. Of the participants, 243 (3.9%) self-reported urinary incontinence<sup>(18)</sup>. This percentage is significantly lower, however it must be considered that the sample was composed of young and community elderly, which differs from the present study with an average age of 70.7 years old, minimum of 60 and maximum of 100 years old and developed in the outpatient context.

In Campinas-SP, researchers verified the occurrence of UI and its characteristics in pre-frail and frail elderly attended at a geriatric outpatient clinic. Of the 100 elderly in the sample, 65 reported urinary incontinence. The predominant characteristics in the sample were the frequency of loss of urine several times a day (61.5%), small amount (61.5%) and very serious impact on daily life (49.2%). The situations where urine loss was most frequent were: Before reaching the toilet (76.9%) and when coughing and sneezing (56.9%)<sup>(19)</sup>.

Regarding the impact on the daily life of the elderly, the value found in the present investigation was close to that of the study *op cit.*, both findings highlight the very serious impact of UI on the elderly population<sup>(19)</sup>.

The significant association ( $p < 0.001$ ) between the condition of frailty and urinary incontinence was also found in a cross-sectional study conducted in Shanghai (China), which investigated factors associated with frailty in 587 hospitalized elderly ( $\geq 65$  years)<sup>(16)</sup>. Similarly, it was observed in a study of 440 institutionalized elderly ( $\geq 80$  years) from four cities in Taiwan. The results showed a prevalence of 19.1% ( $n = 84$ ) elderly with UI, lower than the present study, yet there was a significant association between physical frailty and UI ( $p < 0.001$ )<sup>(20)</sup>.

In Singapore, a cohort study assessed frailty as a risk factor for urinary incontinence. 210 elderly ( $\geq 65$  years old) were interviewed, and of these, urinary incontinence was identified in 47.6%. UI prevalence was higher in frail elderly ( $p < 0.001$ )<sup>(21)</sup>. A cohort study conducted in Coyoacán (Mexico), with 838 seniors in the community, and 15% had frailty. Of the 119 elderly who reported UI, 30.3% ( $n = 36$ ) had an association between frailty and urinary incontinence ( $p < 0.001$ )<sup>(22)</sup>.

In Porto Alegre-RS, cross-sectional research conducted in primary health care analyzed the association between frailty and geriatric syndromes. The sample consisted of 521 elderly. Urinary incontinence was reported by 14% of participants and there was a significant association between frail elderly ( $p = 0.004$ )<sup>(23)</sup>. The percentage of UI found was significantly lower than the present study, but there was an association between urinary incontinence and frailty.

The markers of frailty associated with urinary incontinence were reduced gait speed, decreased handgrip strength, and fatigue and exhaustion. There are limited studies describing the presence of UI in the elderly with frailty markers, however the literature<sup>(2)</sup> points out that age-related neuromuscular changes are implicitly linked to frailty syndrome.

In Tokyo (Japan), a sample of 1,399 community-dwelling older women participated in a cross-sectional study that analyzed the relationship between urinary incontinence and musculoskeletal conditions in older women ( $\geq 75$  years old). The results showed that UI was associated with handgrip strength ( $p < 0.001$ )<sup>(24)</sup>. The results reinforce that musculoskeletal conditions cause mobility limitation and are associated with UI. In turn, reduced mobility is associated with negative outcomes such as obesity, physical inactivity, physical disability, poor quality of life and mortality<sup>(25)</sup>.

Longitudinal cohort investigation conducted in Taipei (Taiwan) associated UI with muscle strength and function in a sample of 761 elderly people ( $\geq 65$  years old). Of the associated variables, gait speed was the only one associated with UI as an independent risk factor ( $p = 0.049$ )<sup>(26)</sup>.

Cross-sectional study conducted in Seoul (South Korea) investigated the association between physical frailty and urinary incontinence. 404 elderly ( $\geq 65$  years old) were interviewed in a geriatric and gerontology outpatient clinic, thus, a similar context to this study. Urinary incontinence was associated with handgrip strength ( $p = 0.01$ )<sup>(27)</sup>.

In Pittsburgh (USA), a cohort study evaluated muscle composition and muscle strength in community-dwelling older women (1,475 women) with stress and urgency UI. Results showed a greater chance of obtaining UI stress when participants demonstrated a 5% or greater decrease in handgrip strength ( $p = 0.047$ ). Gait speed was associated with urgency UI when the elderly women presented 5% or more decline in this marker ( $p = 0.04$ )<sup>(28)</sup>.

Reduction in muscle mass and extremity strength may be associated with pelvic floor muscle dysfunction and lead to loss of urine. Loss of muscle mass and strength are characteristics related to sarcopenia syndrome. Sarcopenia is a muscular disease (muscle failure) with life-long adverse muscle changes<sup>(29)</sup>. It is noteworthy the careful look of nursing

for these elderly, since the results of sarcopenia are adverse, including urinary incontinence with consequent physical and social suffering.

In the city of Campinas-SP, a study was developed to verify the occurrence of UI and the characteristics in frail elderly ( $\geq 60$  years) treated at a geriatric outpatient clinic. The results showed an association between UI and markers: muscle weakness ( $p=0.0197$ ), reduced gait speed ( $p=0,0012$ ), exhaustion ( $p=0.0015$ ) and low physical activity ( $p=0.0223$ )<sup>(19)</sup>. These are results that corroborate the present study, except for the marker low physical activity. However, the sample of this study consisted of elderly people from rural areas who still remained in physical activity.

In Kars Province (Turkey), a cross-sectional study of 168 elderly people assessed the fitness and frailty of older people living in a rural area. The rate of pre-frail elderly was 47.3% and non-frail 45.6%. There was a significant relationship between frailty and urinary incontinence ( $p=0.007$ ). The elderly had good physical health and were less frail, most of them performed activities focused on agriculture and livestock, which corroborates this study<sup>(30)</sup>.

Nursing is often exposed to the need for a multiplicity of care for the elderly without the desired familiarity. The results found in this study provide relevant contributions to clinical nursing practice by pointing out the association of physical frailty condition and its markers with urinary incontinence.

This result collaborates with the critical development of nursing, particularly when assessing the needs of gerontological care. The significant association between frailty and urinary incontinence provides insight and meaning for the nurse during the evaluation of the frail elderly, which translate as a warning, a sign of other clinical changes, such as urinary incontinence.

The study showed some limitations such as the cross-sectional methodological design, which makes it impossible to evaluate the causes and effects. Longitudinal and intervention studies are recommended, which allow monitoring the behavior of the variables and consequently deepening the investigations.

## CONCLUSION

It was observed that the presence of urinary incontinence is associated with the frail elderly, the markers related to muscle mass and strength, which comprise sarcopenia. The practice of gerontological nursing needs to ensure the recurrent assessment of physical frailty in the elderly with urinary incontinence. In this practice, we highlight the physical exercises capable of strengthening the pelvic floor muscles, and the effective implementation is translated by the involvement of a multiprofessional team, in which the nursing professional should be the protagonist, trained for such.

The intent is to perform care practices that may come to minimize and/or delay the process of frailty of the elderly, with emphasis on the management of physical frailty through caloric-protein supplementation, use of vitamin D, reduction of polypharmacy and physical activity practice.

Other observational cohort studies are suggested to evaluate the incidence of urinary incontinence in the frail elderly in a given period.

## REFERENCES



1. Morley JE, Vellas B, Kan GAV, Anker SD, Bauer JM, Bernabei R, et al. Frailty consensus: a call to action. JAMDA. [Internet]. 2013 [access 10 out 2018]; 14(6). Available at: <http://dx.doi.org/10.1016/j.jamda.2013.03.022>.
2. Fried L, Tangen CM, Walston J, Newman AB, Hirsch C, Gottdiener J, et al. Frailty in older adults: evidence for a phenotype. J. Gerontol. A Biol. Sci. Med. Sci. [Internet]. 2001 [access 01 mar 2017]; 56A(3). Available at: <https://doi.org/10.1093/gerona/56.3.m146>.
3. Vetrano DL, Foebel AD, Marengoni A, Brandi V, Collamati A, Heckman GA, et al. Chronic diseases and geriatric syndromes: the different weight of comorbidity. Eur J Intern Med. [Internet]. 2016 [access 21 out 2017]; 27. Available at: <http://dx.doi.org/10.1016/j.ejim.2015.10.025>.
4. Melo BES, Freitas BCR, Oliveira BRC, Menezes RL de. Correlation between signs and symptoms of urinary incontinence and self-esteem in elderly women. Rev. Bras. Geriatr. Gerontol. [Internet]. 2012 [access 13 nov 2017]; 15(1). Available at: <http://dx.doi.org/10.1590/S1809-98232012000100005>.
5. Aguilar-Navarro S, Navarrete-Reyes AP, Grados-Chavarría BH, García-Lara JM, Amieva H, Avila-Funes JA, et al. The Severity of Urinary Incontinence Decreases Health-Related Quality of Life among Community-Dwelling Elderly. J Gerontol A Biol Sci Med Sci. [Internet]. 2012 [access 21 nov 2017]; 67(11). Available at: <https://doi.org/10.1093/gerona/gls152>.
6. Abrams P, Cardozo L, Fall M, Griffiths D, Rosier P, Ulmsten U, et al. The standardisation of terminology in lower urinary tract function: report from the standardisation sub-committee of the International Continence Society. Elsevier. [Internet]. 2003 [access 16 set 2017]; 61(1). Available at: [https://doi.org/10.1016/S0090-4295\(02\)02243-4](https://doi.org/10.1016/S0090-4295(02)02243-4).
7. Instituto Brasileiro de Geografia e Estatística (IBGE). População estimada 2015. [Internet]. 2015 [access 08 abr 2016]. Available at: [https://ww2.ibge.gov.br/home/estatistica/populacao/estimativa2015/estimativa\\_dou.shtm](https://ww2.ibge.gov.br/home/estatistica/populacao/estimativa2015/estimativa_dou.shtm).
8. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state": a practical method for grading the cognitive state of patients for the clinician. J Psychiat Res. [Internet]. 1975 [access 10 out 2018]; 12(3). Available at: [http://dx.doi.org/10.1016/0022-3956\(75\)90026-6](http://dx.doi.org/10.1016/0022-3956(75)90026-6).
9. Bertolucci PHF, Brucki SMD, Campacci SR, Juliano Y. The Mini-Mental State Examination in a general population: impact of educational status. Arq neuropsiquiatr. [Internet]. 1994 [access 22 nov 2017]; 52(1). Available at: <https://www.ncbi.nlm.nih.gov/pubmed/8002795>.
10. Instituto Brasileiro de Geografia e Estatística (IBGE). Modalidades alternativas de censos demográficos: aspectos de integração das pesquisas domiciliares. [Internet]. 2005 [access 08 abr 2016]. Available at: [https://ww2.ibge.gov.br/home/estatistica/populacao/censo\\_continuo/grupos\\_de\\_trabalho/EMACD\\_integracao.pdf](https://ww2.ibge.gov.br/home/estatistica/populacao/censo_continuo/grupos_de_trabalho/EMACD_integracao.pdf).
11. Fess EE. Grip strength. In: Casanova JS. American Society of Hand Therapists. Clinical assessment recommendations. Chicago: American Society of Hand Therapists (ASHT). [Internet]. 1992 [access 30 maio 2016]. Available at: <https://www.asht.org/practice/clinical-assessment-recommendations>.
12. Batistoni SST, Neri L, Cupertino APFB. Validity of the Center for Epidemiological Studies Depression Scale among Brazilian elderly. Rev. Saúde Pública [Internet]. 2007 [access 30 maio 2016]; 41(4). Available at: <http://dx.doi.org/10.1590/S0034-89102007000400014>.
13. Lustosa LP, Pereira DS, Dias RC, Britto RR, Perentoni AN, Pereira LSM. Translation and cultural adaptation of the Minnesota Leisure Time Activities Questionnaire in community-dwelling older people. Geriatr Gerontol [Internet]. 2011 [access 30 maio 2016]; 5(2). Available at: <http://ggaging.com/details/245/pt-BR/translation-and-cultural-adaptation-of-the-minnesota-leisure-time-activities-questionnaire-in-community-dwelling-older-people>.
14. Tamanini JTN, Dambros M, D'Ancona CAL, Palma PCR, Rodrigues Netto Jr N. Validação para o português do "International Consultation on Incontinence Questionnaire - Short Form" (ICIQ-SF). Rev Saúde Pública. [Internet]. 2004 [access 17 out 2017]; 38(3). Available at: <http://dx.doi.org/10.1590/S0034-89102004000300015>.

15. Melo Filho J. Fragilidade física e efeitos do treinamento físico com jogos virtuais e suplementação proteica em idosos do município de Curitiba-PR [tese]. Curitiba (PR): Universidade Federal do Paraná; 2019 [access 23 abr 2019]. Available at: <https://hdl.handle.net/1884/60347>.
16. Wei Y, Cao Y, Yang X, Xu Y. Investigation on the frailty status of the elderly inpatients in Shanghai using the FRAIL (fatigue, resistance, ambulation, illness, and loss) questionnaire. *Medicine*. [Internet]. 2018 [access 01 jun 2018]; 97(18). Available at: <https://doi.org/10.1097/MD.00000000000010581>.
17. Silva SLA da, Neri AL, Ferrioli E, Lourenço RA, Dias RC. Fenótipo de fragilidade: influência de cada item na determinação da fragilidade em idosos comunitários – Rede Fibra. *Ciênc. Saúde Coletiva*. [Internet]. 2016 [access 23 abr 2019]; 21(11). Available at: <http://dx.doi.org/10.1590/1413-812320152111.23292015>.
18. Park J, Hong GRS. Association of Functional Ability and Benign Prostatic Hyperplasia With Urinary Incontinence in Older Korean Men. *Int Neurourol J* [Internet]. 2016 [access 23 maio 2018]; 20(2). Available at: <https://doi.org/10.5213/inj.1630432.216>.
19. Silva VA, D'elboux MA. Factors associated with urinary incontinence in elderly individuals who meet frailty criteria. *Texto contexto- enferm* [Internet]. 2012 [access 08 nov 2017]; 21(12). Available at: <http://dx.doi.org/10.1590/S0104-07072012000200011>.
20. Wang CJ, Hung CH, Tang TC, Chen LY, Peng LN, Hsiao FY, et al. Urinary Incontinence and Its Association with Frailty Among Men Aged 80 Years or Older in Taiwan: a cross-sectional study. *Rejuvenation Res*. [Internet]. 2017 [access 13 out 2017]; 20(2). Available at: <https://doi.org/10.1089/rej.2016.1855>.
21. Chong E, Chan M, Lim WS, Ding YY. Frailty Predicts Incident Urinary Incontinence Among Hospitalized Older Adults. A 1-Year Prospective Cohort Study. *J Am Med Dir Assoc* [Internet]. 2018 [access 23 maio 2018]; 19(5). Available at: <https://doi.org/10.1016/j.jamda.2017.12.103>.
22. Castrejón-Pérez RC, Borges-Yáñez SA, Gutiérrez-Robledo LM, Avila-Funes JA. Oral health conditions and frailty in Mexican community-dwelling elderly: a cross sectional analysis. *Bmc Public Health*. [Internet]. 2012 [access 03 out 2017]; 12(1). Available at: <https://www.ncbi.nlm.nih.gov/pubmed/22971075>.
23. Closs VE, Ziegelmann PK, Gomes I, Schwanke CHA. Frailty and geriatric syndromes in elderly assisted in primary health care. *Acta Scientiarum. Health Sciences* [Internet]. 2016 [access 19 set 2018]; 38(1). Available at: <http://dx.doi.org/10.4025/actascihealthsci.v38i1.26327>.
24. Kim H, Yoshida H, Hu X, Saito K, Yoshida Y, Kim M, Hirano H, et al. Association between self-reported urinary incontinence and musculoskeletal conditions in community-dwelling elderly women: a cross-sectional study. *Neurourol. Urodyn*. [Internet]. 2014 [access 01 jun 2018]; 34(4). Available at: <https://doi.org/10.1002/nau.22567>.
25. Griffith LE, Raina P, Levasseur M, Sohel N, Payette H, Tuokko H, et al. Functional disability and social participation restriction associated with chronic conditions in middle-aged and older adults. *J Epidemiol Community Health*. [Internet]. 2017 [access 23 abr 2019]; 71(4). Available at: <https://doi.org/10.1136/jech-2016-207982>.
26. Lee WJ, Liu CY, Sun CC, Chen LK. Walking speed, not muscle mass, is associated with urinary incontinence in community-dwelling old Taiwanese. *Neurourol. Urodyn*. [Internet]. 2015 [access 23 maio 2018]; 35(8). Available at: <https://doi.org/10.1002/nau.22848>.
27. Kang J, Kim C. Association between urinary incontinence and physical frailty in Korea. *Australasian Journal On Ageing*. [Internet]. 2018 [access 23 maio 2018]; 37(3). Available at: <https://doi.org/10.1111/ajag.12556>.
28. Suskind AM, Cawthon PM, Nakagawa S, Subak LL, Reinders I, Satterfield S, et al. Urinary Incontinence in Older Women: the role of body composition and muscle strength: from the health, aging, and body composition study. *J Am Geriatr Soc* [Internet]. 2017 [access 01 jun 2018]; 65(1). Available at: <https://doi.org/10.1111/jgs.14545>.

29. Cruz-Jentoft AJ, Bahat G, Bauer J, Boirie Y, Bruyère O, Cederholm T, et al. Sarcopenia: revised European consensus on definition and diagnosis. Age Ageing [Internet]. 2019 [access 24 abr 2019]; 48(1). Available at: <https://doi.org/10.1093/ageing/afy169>.

30. Çakmur H. Frailty Among elderly adults in a rural Area of turke. Med Sci Monit. [Internet]. 2015 [access 24 abr 2019]; 21. Available at: <https://dx.doi.org/10.12659/2FMSM.893400>.

Received: 27/05/2019

Finalized: 12/12/2019

Associate editor: Susanne Elero Betioli

Corresponding author:

Dayana Cristina Moraes

Universidade Federal do Paraná

R. Lothario Meissner, 632 - 80210-170 - Curitiba, PR, Brasil

E-mail: [dayanac.moraes@gmail.com](mailto:dayanac.moraes@gmail.com)

Role of Authors:

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - DCM, CLS, LSS, BHM, GMVF

Drafting the work or revising it critically for important intellectual content - MHL

Final approval of the version to be published - MHL

Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - MHL

---