Reduced gait speed in hospitalized older adults: associated sociodemographic and mobility characteristics

Avaliação da velocidade da marcha reduzida em pessoas idosas hospitalizadas e associação com características sociodemográficas e de mobilidade

Evaluación de la velocidad de la marcha reducida en adultos mayores hospitalizados y asociación con las características sociodemográficas y de movilidad

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ABSTRACT | This study aims to evaluate the predominance of reduced gait speed in hospitalized older people and to verify the association with demographic and mobility factors. This is a cross-sectional, quantitative study conducted with older adults from a teaching hospital in Paraná (2020–2021) (n=662). Sociodemographic and health questionnaires were applied, as well as the Clinical-Functional Vulnerability Index (CFVI-20). The Chi-square test was employed. Most participants were men (51.8%), aged from 60 to 69 years (49.2%), married (47.9%), retired or pensioners (69.5%), and with low education level (31.3%). Reduced gait speed was present in 37.61% of the older adults and associated with: age <70 years (p=0.003); non-exercise of work activity (p=0.045); inability to raise arms above shoulders (p=0.05) and handle and hold small objects (p=0.011); and having stopped using the mobile phone (p<0.001) and bathing alone (p=0.001) due to health. It is concluded that the predominance of older people with reduced gait speed was high, associated with the demographic characteristics of advanced age and non-exercise of labor activity. Regarding mobility factors, all the older adults showed an association with reduced gait speed.

Keywords | Aged; Gait Speed; Hospitalization; Geriatric Health Care.

RESUMO | O objetivo deste estudo foi avaliar o predomínio de velocidade de marcha reduzida em pessoas idosas hospitalizadas e verificar a associação com fatores demográficos e de mobilidade. Trata-se de um estudo transversal, quantitativo, realizado com pessoas idosas de um hospital de ensino do Paraná (2020-2021) (n=662). Foi aplicado questionário sociodemográfico, de saúde e o Índice de Vulnerabilidade Clínico Funcional (IVCF-20). A análise foi pelo teste qui-quadrado. A amostra foi composta na maioria por homens (51,8%), com idade entre 60 e 69 anos (49,2%), casados (47,9%), aposentados ou pensionistas (69,5%) e de baixa escolaridade (31,3%). A velocidade de marcha reduzida esteve presente em 37,61% das pessoas idosas e associada à idade <70 anos (p=0,003); ao não exercício da atividade laboral (p=0,045); à incapacidade de elevar os braços acima

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dos ombros (p=0,05) e de manusear e segurar pequenos objetos (p=0,011); e a deixar de usar o celular (p<0,001) e tomar banho sozinho (p=0,001) por conta da saúde. Conclui-se que o predomínio de pessoas idosas com a velocidade de marcha reduzida foi alto, associado às características demográficas de idade avançada e não exercício de atividade laboral. Em relação aos fatores de mobilidade, todos os avaliados apresentaram associação com a velocidade de marcha reduzida.

Descritores | Idoso; Velocidade de Caminhada; Hospitalização; Atenção à Saúde do Idoso.

RESUMEN | Este estudio tuvo el objetivo de evaluar el predominio de velocidad de la marcha reducida en adultos mayores hospitalizados y verificar su asociación con factores demográficos y de movilidad. Se trata de un estudio transversal, cuantitativo, realizado con adultos mayores de un hospital de enseñanza de Paraná (2020-2021) (n=662). Se aplicó un cuestionario sociodemográfico, de salud y el Índice de Vulnerabilidad Clínica Funcional (IVCF-20). Se realizó el análisis mediante la prueba de chi-cuadrado. La muestra estuvo compuesta en su mayoría por hombres (el 51,8%), de 60 a 69 años (el 49,2%), casados (47,9%), jubilados o pensionados (el 69,5%) y con baja escolaridad (el 31,3%). La velocidad de la marcha reducida estuvo presente en el 37,61% de los adultos mayores y se asoció con la edad <70 años (p=0,003); no ejercer una actividad laboral (p=0,045); la incapacidad para levantar los brazos por encima de los hombros (p=0,05) y de manipular y sostener objetos pequeños (p=0,011); dejar de utilizar el teléfono móvil (p<0,001) y ducharse solo (p=0,001) debido a la salud. Se concluye que el predominio de adultos mayores con velocidad de la marcha reducida fue alto, y se asoció con las características demográficas de edad avanzada y no ejercer una actividad laboral. En cuanto a los factores de movilidad, todas las personas evaluadas se asociaron con la velocidad de la marcha reducida.

Descriptores | Adulto Mayor; Velocidad de Marcha; Hospitalización; Atención de Salud del Adulto Mayor.

INTRODUCTION

The older population' health is directly related to their functional ability to perform tasks and make decisions by themselves. Thus, exercising instrumental activities of daily living (IADL) and basic activities of daily living (BADL) without difficulties is essential for the quality of life of older aduls[1]. Several factors affect functional capacity, and one of them is gait [2].

Gait can be defined as a sequence of actions of the lower limbs to move the body, while simultaneously maintaining a stable posture and rhythmic and pattern-based movement, thus moving the center of mass[3]. For these movements to occur harmoniously, one must find a perfect balance between external forces acting on the body and the response of internal forces[2]. Thus, the gait is a relevant function and involves the integration of several systems, such as cortical control, neuromuscular system, and external environment[4].

Gait assessment is complex and involves several contexts and changes, one of them being the slowed pace[2]. The slowed pace of gait can be identified when the patient performs the gait speed (GS) test and exceeds five seconds to walk four meters[5], considered one of the main determinants for the presence of sarcopenia[5]. Moreover, reduced gait can lead to several consequences in the lives of older people, such as falls, cognitive decline, dependence to perform activities of daily living, reduced quality of life, stress[2], institutionalization, caregiver need, hospitalization, and mortality[6].

There are several factors linked to GS reduction, such as sociodemographic conditions, health problems, lifestyle, and even hospitalization[7]. Longer hospitalization can lead to several limitations, such as frailty, *delirium*, and increased vulnerability[8]. Moreover, some factors may present greater notability, such as reduced muscle strength, loss of stability, poor physical performance, and failure to coordinate the biological systems[7].

However, there are few studies with hospitalized older adults[9], even less so regarding GS reduction. Therefore, it is necessary to enhance knowledge on the subject, with a view to promoting targeted health care strategies for older adults to promote comprehensive health care and quality of life, especially in the hospital environment[9].

Therefore, this study aimed to evaluate the predominance of reduced gait speed in hospitalized older adults and to verify the association with demographic and mobility factors.

METHODOLOGY

Study design and location

This is an observational, cross-sectional study conducted with all older adults admitted to a teaching hospital in Paraná (2020-2021).

Sample and selection criteria

Convenience sampling was adopted, including all hospitalized older adults available in the aforementioned time interval and institution where the data were collected. The following eligibility criteria were considered: being 60 years old or older; being hospitalized in the last 48 hours in the medical clinic and/or surgical wards; and being able to respond to instruments and physical examinations. Individuals who did not perform the gait speed test, or who did not have this information completed in the evaluation instrument, were excluded. The final sample comprised 662 individuals.

Data collection

Data were collected in the patient's room by the appropriately trained gerontological care team. Sociodemographic, mobility, and clinical functional characteristics were evaluated by the validated instrument Clinical-Functional Vulnerability Index (CFVI-20).[5].

The CFVI-20 was developed and validated in Brazil as a rapid screening instrument that evaluates multidimensional aspects of the health status of older people[5]. The instrument considers the main predictors of functional decline and/or death: age, self-perceived health, activities of daily living, cognition, mood, mobility, communication, and multimorbidy[5]. For this study, the CFVI-20 questions concerning the mobility dimension were considered, as well as the physical gait speed test.

Gait speed was measured with a stopwatch, in a standardized way, as recommended by the CFVI-20, by a four-meter demarcation on the floor[5]. If the individual took longer than five seconds to walk (0.8 m/s speed), it meant that they had reduced gait speed[5].

Data analysis and processing

Gait speed was considered as dependent variable. The independent variables were sociodemographic characteristics: sex (female and male); age (60–69 years; 70–79 years; ≥80 years); marital status (married or in a stable union, widowed, divorced, or single); profession (retired or pensioner; homemaker; active in labor activity); and education level (collected in years and categorized in 12 or more years, 9–11, 5–8, 1–4 years, and illiterate), as well as mobility characteristics extracted and/or adapted from CFVI-20: Are you able to raise your arms above shoulder level? (yes, no); Are you able to handle or hold small objects? (yes, no); Because of your health or physical condition, have you stopped using your mobile phone? (yes, no, or stopped using the mobile phone for reasons other than health or do not use the mobile phone); Because of your health or physical condition, have you stopped bathing alone? (yes, no).

Descriptive analysis of the data was performed by absolute and relative frequency and statistical analysis by the Chi-square test. Epi Info™ for Windows was used.

Ethical aspects

This study is part of a larger project.

RESULTS

Most participants were men, aged from 60 to 69 years, married, retired or pensioners, and with low education level. Reduced GS was present in 37.61% of the older adults and associated with: age (p=0.003); non-exercise of work activity (p=0.045); inability to raise arms above shoulders (p=0.05) and to handle and hold small objects (p=0.011); and having stopped using the mobile phone (p<0.001) and bathing alone (p=0.001) due to the health status (Table 1).

Table 1. Distribution of reduced gait speed according to sociodemographic and mobility characteristics of hospitalized older adults. Ponta Grossa, Paraná, Brazil, 2020-2021 (n=662)

Reduced GS			
Parameter	No n(%)	Yes n(%)	Total n(%)	p-value
Reduced GS	413 (62.4)	249 (37.6)	662 (100)	
Sex				0.260
Female	192 (60.2)	127 (39.8)	319 (48.2)	
Male	221 (64.4)	122 (35.6)	343 (51.8)	

(continues)

Table 1. Continuation

Parameter	No n(%)	Yes n(%)	Total n(%)	p-value
Reduced GS				
Age				0.003
60 to 69 years	222 (68.1)	104 (31.9)	326 (49.2)	
70 to 79 years	130 (60.2)	86 (39.8)	216 (32.6)	0.029
80 years or older	61 (50.8)	59 (49.2)	120 (18.1)	<0.001
Marital Status				0.629
Married/Stable union	195 (61.5)	122 (38.5)	317 (47.9)	
Widowed	136 (61.0)	87 (39.0)	223 (33.7)	0.450
Divorced	51 (68.9)	23 (31.1)	74 (11.2)	0.118
Single	31 (64.6)	17 (35.4)	48 (7.2)	0.341
Profession				0.169
Retired/Pensioner	292 (63.5)	168 (36.5)	460 (69.5)	
Homemaker	36 (70.6)	15 (29.4)	51 (7.7)	0.158
Labor activity	60 (73.2)	22 (26.8)	82 (12.4)	0.045
Not informed	25 (36.2)	44 (63.8)	69 (10.4)	
Education level				0.259
12 or more years	13 (54.2)	11 (45.8)	24 (3.6)	
9 to 11 years	11 (57.9)	8 (42.1)	19 (2.9)	0.403
5 to 8 years	55 (56.1)	43 (43.9)	98 (14.8)	0.431
1 to 4 years	72 (66.1)	37 (33.9)	109 (16.5)	0.136
Illiterate	40 (50.0)	40 (50.0)	80 (12.1)	0.360
Not informed	222 (66.9)	110 (33.1)	332 (50.1)	
Inability to raise arms above shoulders				0.05
No	342 (64.3)	190 (35.7)	532 (80.4)	
Yes	71 (55.0)	58 (37.5)	129 (19.5)	
Inability to handle or hold small objects				0.011
No	370 (64.2)	206 (35.8)	576 (87.0)	
Yes	43 (50.0)	43 (50.0)	86 (13.0)	
Stopped using the mobile phone due to health or physical condition				<0.001
No	366 (65.6)	192 (34.4)	558 (84.3)	
Yes	47 (45.2)	57 (54.8)	104 (15.7)	
Stopped bathing alone due to health or physical condition				<0.001
No	251 (81.2)	58 (18.8)	309 (46.7)	
Yes	162 (45.9)	191 (54.1)	353 (53.3)	

The sample consisted mostly of men, aged from 60 to 69 years, married, retired or pensioners, and with low education level. The prevalence of reduced GS was 37.61% (Table 1). Reduced GS was associated with: age (p=0.003); non-exercise of work activity (p=0.045); inability to raise arms above shoulders (p=0.05) and to handle and hold small objects (p=0.011); and having stopped using the mobile phone (p<0.001) and bathing alone (p=0.001) due to health (Table 1).

DISCUSSION

In this study, there was a high prevalence of reduced GS associated with advanced age, non-exercise of labor activity, inability to raise arms above the shoulders and to handle or hold small objects, and difficulty performing activities of daily living such as using mobile phones and bathing alone.

Despite the few studies on reduced GS considering the same parameters of standard GS cutoff (0.8 m/s), similar values were found in previous studies[6,10]. A study with 5,501 older adults from the five Brazilian regions found that 34.26% presented reduced GS[6]. The study by Madrid[10] with 1,327 individuals over 65 years old detected that 42.6% had reduced GS. A Korean study

including 649 patients showed that hospitalization costs can be significantly reduced by increasing the GS of hospitalized older adults[11].

As few studies investigated GS in the hospital environment[9], there were no parameters of comparability with the hospital setting; however, it was expected that the frequency of reduced GS in this population would be higher than in the general population, since a higher degree of frailty and exacerbations of health problems are commonly found in the hospital environment. Furthermore, this environment shows a greater number of bedridden people, as well as the use of medications and prolonged hospitalization, which may impact the level of consciousness and discernment of real information, conditions that are directly related to reduced gait speed[8]. Nevertheless, the similarity of the findings with the literature on the community setting may be due to the time of information collection, which was in the first 48 hours of hospitalization, and hospitalization may not have had an impact on functionality.

Thus, one must evaluate the condition of each patient to obtain more accurate results in the clinical practice, determining whether limited functionality is permanent or transient due to the patient's clinical status. In this sense, the multidisciplinary team must track signs of senility and seek to adapt the patient's routine, in addition to prioritizing independence and autonomy in the hospital setting by drawing up therapeutic plans appropriate to each condition.

The association found between the increase in reduced GS with advancing age corroborates the findings of the national[12] and international[13] literature. In a cohort study conducted in accredited clinics with 421 older adults, the authors have shown that age was a negative factor in older adults' GS, causing an annual decline in GS[14].

A reduction in muscle mass, body water, and bone mass, as well as the redistribution of adipose tissue are expected characteristics related to aging[14]. However, this process can be aggravated by lifestyle, poor diet, and lack of physical exercise, causing greater impairments such as reduced muscle strength, decreased agility, and loss of balance, leading to undesirable outcomes[7].

By analyzing the relationship between reduced GS and paid labor activity, it was found that individuals who continue to work had lower prevalence of reduced GS, corroborating the literature[15,16]. A study conducted in Tokyo, Japan, showed that exercising a labor activity in old age can reduce the decline in activities of daily living (ADL)[16]. Similarly, a study conducted in the Southern

Brazil showed that rural women who spent their lives working in the countryside (a context that requires greater muscle strength and mobility) had a lower risk of sarcopenia[15], a syndrome largely related to muscle strength and gait speed.

Thus, a direct relationship between working and physical conditioning, maintenance of muscle strength and mobility can be established, which are crucial conditions for maintaining adequate GS and functionality of the older adults[15,16]. The influence of work on mood, cognition, and the social field is also noteworthy[17]. In other words, for an older adult to keep working, they must feel valued, as a contributor to society, as well as developing new significant social interactions[18], factors that are important also in physiological reserves and that affect functionality.

Following the associations found in this study, among the ADLs investigated and upper limb disabilities (which are closely related to the ability to perform ADLs) all of them were associated with reduced GS. Similarly, a Brazilian study found that people with functional impairment in at least one ADL were 2.4 times more likely to have reduced GS[12]. Another study conducted by the Brazilian Longitudinal Study on Aging database, with 536 older adults, showed that physically active individuals who have a higher GS have fewer limitations to perform ADLs[19].

In a systematic review, the authors found that the reduction of muscle mass and physical performance were directly related to the development of dependence on IADL and BADL[20]. Thus, performing the psychomotor speed test may be essential to assess the slowness of a skill in various functional domains, as well as be a predictor of quality of life[21].

Moreover, the gait speed test makes it possible to identify compensation strategies and assess possible risks to the health of older adults[21]. Also, a prospective study pointed out that GS can be a valuable prognostic factor in the early identification of palliative care for patients in the geriatric ward[22]. Therefore, patients with altered GS may have multiple disabilities and pathologies that affect BADL or IADL, which causes a decline in their functionality[23]. It is up to health professionals, especially the physical therapists, to restore and preserve physical functionality, as well as to prevent or minimize possible limitations[24].

A comprehensive evaluation of these patients is essential, tracking possible difficulties and restrictions. It is necessary to update public policies aimed at the geriatric services to bring the population closer, because

in the current public health context there is a large gap in accessibility to services. In this sense, the fundamental role of health professionals is highlighted, understanding the sociocultural context of each patient to provide qualified and targeted care.

One of the limitations of the study is the lack of investigation of the reasons for hospitalization, which may have influenced the prevalence of the GS found. Notably, the hospital where the data collection was performed is considered a reference in trauma and elective surgeries, a condition that may be related to a greater gait slowdown, which should be cautiously analyzed, since it is not possible to specify whether it is a transient or permanent condition. Furthermore, due to the applied traceability instrument not considering the individual's history, any hospitalized older adults were included, regardless of their functional condition prior to hospitalization and/or underlying disease. Thus, those who were bedridden or with previous locomotor difficulties were also considered in the study and classified as people with slowed gait speed. A previous study indicates that GS is likely influenced by the severity and type of disease[25]. Also, the length of hospitalization may have been a relevant factor, since it may not be possible to evaluate the effects of hospitalization on mobility in just 48 hours. A study describes that, in the post-discharge period, there is a mixed report of functional trajectories, that is, they reach their functional baseline pre-admission, and then there is worsening or improvement of the functional condition[25]. It would be necessary to evaluate these characteristics at both admission and discharge, but this was not the object of the study.

Given these limitations, it can be inferred that they do not disqualify the importance of the findings, especially in the case of hospitalized older adults. Thus, future studies should focus on the comparability of GS at different times of hospitalization, as well as take into account consider pre-existing factors.

CONCLUSION

There was a high prevalence of older adults with reduced gait speed related to advanced age and not working. Moreover, all mobility factors, such as inability to raise arms above the shoulders and to handle or hold small objects, having stopped using the mobile phone and bathing alone due to health or physical condition, were associated with the studied condition.

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