Use of the activities and participation profile to assess the functioning of physically inactive elderly

Uso do perfil de atividades e participação para avaliação da funcionalidade de idosos inativos fisicamente

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Abstract

Introduction: Physical inactivity negatively impacts the functional status of the elderly during aging. **Objective:** To describe the activity and participation profile of physically inactive elderly and to investigate associated factors. **Methods:** A cross-sectional study with physically inactive elderly, aged ≥ 60 years, both sexes, with good cognitive function and independent gait. Personal factors, clinical history, history of falls in the last year, and identification of activity and participation profiles were investigated. Nonparametric statistical tests (SPSS 20.0) were performed, considering $p < 0.05$ significant. **Results:** The elderly (n = 36) had a mean age of 72.5 years (±7.7). Most were women (78%), with one to four years of education (69%), retired (72%), referring episodes of falling (58%) and affected by two to four comorbidities (53%). In the activities and participation profile, most of the physically inactive elderly presented mild problems for: crawling, kneeling, squatting, walking long distances, walking on different surfaces, walking around obstacles, climbing, and using public transportation. However, kneeling, squatting, walking on different surfaces, and climbing represented higher percentages of elderly who presented some problem. The advancement of age ($p = 0.045$), female sex ($p = 0.022$), episodes of falls ($p = 0.037$), and comorbidities ($p = 0.031$) were identified as factors that can impact functioning. **Conclusion:** The physically inactive elderly presented a mild problem in activities and participation items that are more related to strength and walking. Elderly aged over 70, female, with episodes of falls and comorbidities were significantly associated with reduced or impaired functioning.

Keywords: Elderly. Functional physical performance. ICF. Social participation.

Resumo

Introdução: *A inatividade física impacta negativamente a funcionalidade dos idosos durante o envelhecimento.* ***Objetivo:*** *Descrever o perfil de atividade e participação de idosos inativos fisicamente e investigar fatores associados.* ***Métodos:*** *Estudo transversal com idosos inativos fisicamente, ≥ 60 anos, ambos os sexos, boa função cognitiva e independentes na marcha. Foram investigados fatores pessoais, história clínica, histórico de quedas no último ano e identificação do perfil de atividade e participação. Foram realizados testes estatísticos não paramétricos (SPSS 20.0), considerando p < 0,05.* ***Resultados:*** *Os idosos (n = 36) apresentaram média de 72,5 anos (± 7,7). A maioria era mulher (78%), com escolaridade de um a quatro anos de estudo (69%), aposentados (72%), referindo episódios de queda (58%) e acometidos por duas a quatro comorbidades (53%). No perfil de atividades e participação, a maioria dos idosos inativos fisicamente apresentaram problema leve para os itens: engatinhar, ajoelhar-se, agachar-se, andar longas distâncias, andar sobre superfícies diferentes, andar desviando-se de obstáculos, subir e utilizar transporte público. Entretanto, ajoelhar-se, agachar-se, andar sobre superfícies diferentes e subir compreendem maiores percentuais de idosos que apresentaram algum problema. Idade avançada (p = 0,045), sexo feminino (p = 0,022), episódios de quedas (p = 0,037) e presença de comorbidades (p = 0,031) foram identificados como fatores que podem impactar na funcionalidade.* ***Conclusão:*** *Idosos inativos fisicamente apresentaram problema leve nos itens das atividades e participação que estão mais relacionados à força e ao andar. Idosos com mais de 70 anos, do sexo feminino, com presença de episódios de quedas e de comorbidades, apresentaram associação significativa com a funcionalidade reduzida ou prejudicada.*

Palavras-chave: *Idoso. Desempenho físico funcional. CIF. Participação social.*

Introduction

An increase in life expectancy has been occurring at an accelerated rate in many countries in recent years. A prolonged life span may be accompanied by several changes in the structure and function of body systems, causing changes in the behavior of this population.[1] Understanding the health-related problems of the elderly becomes essential to adapt health care to their needs.[2]

Elderly people may present health problems with a predominance of chronic non-communicable diseases, which can impact autonomy, increasing the degree of dependence and disability.[3-5] In the field of gerontology, assessing functional status is as important as assessing the other diseases that impact this population. The identification of a potential impairment profile facilitates the selection of preventive strategies and can prolong the onset of physical frailty that occurs at advanced ages, contributing to the establishment of early interventions.[1,6,7]

The loss of body functions for the elderly population results in drastic consequences and undesirable events such as organic alterations, susceptibility to falls, and social isolation. Furthermore, the level of inactivity is increased, which is a factor of great concern, as the elderly often have insufficient activity levels.[6] This extreme inactive behavior reduces functioning, resulting from decreased functional mobility and an inability to perform tasks, directly impacting well-being and quality of life.[1,6]

Several instruments are used to assess functional status in this specific group, however, lack of standardized instruments with a good level of accuracy for use in studies leads to difficulty in obtaining health measures for older people.[8] A recognized tool to describe functioning is the International Classification of Functioning, Disability and Health (ICF), published by the World Health Organization (WHO), which intends to unify a system for coding health information, with a standardized language that enables global health communication.[8,9]

This tool addresses several aspects related to human functions and their restrictions through the components of functioning, disability, and contextual factors. According to the ICF, functioning is prioritized as a health component, considering the environment as a facilitator or a barrier to performing activities and participation. Activity is the realization of a task or action by an individual, and represents a person's individual perspective on functioning. Participation is the involvement in a life situation and represents the social perspective of functioning.[10]

In chapter 4 of the ICF (WHO), the "activities and participation" component, deals with all aspects related to mobility, which is fundamental for healthy aging are adressed.[11] A decline in mobility is associated with decreased functioning,[11] and assessing these

components is particulary relevant as they are prerequisites for independent living at home.[12] These aspects allow us to assess ability and facilitate the identification of major problems in performing tasks of daily living.[11]

From this perspective, the "activities and participation" component has proved to be very relevant among all the ICF components regarding the functional status of elderly patients.[12] The utilization of this tool has been minimally explored and implemented, not only in the health sector, but also in different domains related to the functioning of this population. Therefore, the objective of this study was to describe the activity and participation profile of physically inactive elderly people, and investigate associated factors.

Methods

This was a cross-sectional observational study approved by the Ethics Committee on Human Research of the Universidade Federal de Pernambuco (CAAE: 17868719.5.0000.5208). The participants were informed about their right to refuse participation, and about the confidentiality procedures. Their participation was confirmed by signing the Terms of Free and Informed Consent Form.

The non-probabilistic and intentional sampling was composed of elderly individuals recruited from the Elderly Health Project, which aims to monitor the aging process, promote health actions focused on improving quality of life, and prevent diseases by means of multidisciplinary care at the Belarmino Correia Regional Hospital in Goiana, Pernambuco, Brazil. The participants included in the sample were the elderly attending a medical checkup with the project geriatrician, between the months of November of 2019 and April of 2020.

The elderly included in the study were: physically inactive, older than 60 years of age, able to understand instructions, able to walk independently, and had good cognitive function according to the Mini Mental State Examination (MMSE) scores in relation to their level of education.[13,14] They were free of severe visual system dysfunctions and lower limb impairments. Elderly with neurological diseases, orthopedic, rheumatic and/or vascular pathologies that could result in moderate or severe functional restriction in one or both lower limbs (not allowing independent ambulation), with history of fracture in the last year, and/or vestibulopathies were excluded from the study.

The level of physical activity was determined according to the weekly number of minutes the elderly exercised. The criteria adopted were based on the recommendations of the American College of Sports Medicine (ACSM) and the American Heart Association (AHA),[15] which consider a physically active individual to be one who practices a minimum of 30 minutes of moderate intensity physical activity (five times a week) or 20 minutes of vigorous intensity physical activity (at least three times a week). Individuals who did not meet these recommendations were considered physically inactive.[15]

The study participants underwent a general and dynamic assessment. A form containing sociodemographic data (age - in complete years, from the birth date to the data collection date; level of education - years of education; sex; occupation) and clinical data (history of falls and comorbidities) was used for general assessment. The dynamic component evaluated and classified the elderly according to the activities and participation profile (APP).[16] The elderly were asked to execute the profile items to be scored, with the exception of items 14, 18-23, which were assigned according to report by themselves and their caregivers. Data collection was accomplished in a single session, scheduled according to the elderly person's availability.

The APP was evaluated by means of 23 activities/participation items (n = 25) from the ICF chapter 4, referring to mobility:[16] 1. sitting; 2. lying down; 3. rolling over to the right (3.1) and left (3.2) sides; 4. transferring oneself while lying down to the right (4.1) and left (4.2) sides; 5. crawling; 6. kneeling; 7. bending; 8. transferring oneself while sitting; 9. standing; 10. squating; 11. kicking; 12. pushing with lower extremities; 13. awalking short distances; 14. walking long distances; 15. awalking on different surfaces; 16. walking around obstacles; 17. climbing; 18. moving around within the home (internal area); 19. moving around within buildings other than home (external area); 20. moving around outside the home and other buildings; 21. using private transportation; 22. using public transportation; 23. driving motorized vehicles.

Each APP item is scorable using a range from zero to four. The sum of the scores ranges from 0 to 100, and the corresponding score is obtained by dividing the sum of the scores by the number of items. The scores

correspond to the interpretations: 0 = no problem (0-4%); 1 = mild problem (5-24%); 2 = moderate problem (25-49%); 3 = severe or extreme problem (50-95%); 4 = complete problem (96-100%); 8 = not specified; 9 = not applicable.[9,16] The APP is related to both individual and social functioning perspectives.

Statistical analyses were performed using the SPSS software. Descriptive analyses were used to compile the sample data and were expressed by means of qualitative and quantitative univariate analysis. Data without a normal distribution were confirmed by the Shapiro-Wilk test, however the values of mean and standard deviation were included in the tables because they correspond to the interpretation of the APP scores according to the ICF. The variables that constituted the personal factors, and the percentage of the elderly with difficulty in the APP items were analyzed by means of the Kruskal-Wallis test with post-hoc Newman-Keuls test. The X2 test was used to verify the association between the event of falls and the performance in the APP. All analyses considered $p < 0.05$ significant.

Results

A total of 85 elderly individuals were interviewed, of which 49 were excluded for not meeting the eligibility criteria. Therefore, 36 elderly individuals were included in the data analysis, with a mean age of 72.5 (± 7.7) years (range of 60 to 90 years), predominantly female (78%), with one to four years of schooling (69%), retired (72%), reporting a fall in the last year (58%), and having two to four comorbidities (53%) (Table 1).

The scores obtained by the APP showed that the elderly presented mild problems for the following items: crawling, kneeling, squatting, walking long distances, walking on different surfaces, walking around obstacles, climbing, and using public transportation. Study participants showed no problems executing the requested tasks for remaining items of the APP. None of the APP activities were classified as a "complete problem". The item, driving motorized vehicles, received a score of 9 (not applicable) in 32 elderly subjects (89%). No item on the APP received a score of 8 (not specified) (Table 2).

The APP items classified as mild problem, a range of scores between 0-2 (no problem to moderate problem), were found for the items: crawling, walking on different surfaces, walking around obstacles and climbing; the items kneeling, squatting, walking long distances, and using public transportation reached a range of scores between 0-3 (no problem to severe problem) (Table 2).

Table 1 - Univariate qualitative description of the variables related to personal factors of the sample (n = 36)

Personal factors	n (%)
Age (years)	
60-69	15 (42)
70-79	15 (42)
>80	6 (16)
Sex	
Female	28 (78)
Male	8 (22)
Education (years)	
1 - 4	25 (69)
5 – 7	11 (31)
Occupation	
Retired	26 (72)
Housewife/formal or informal work	10 (28)
Comorbities	
0 - 1	17 (47)
2 – 4	19 (53)
Number of falls	
0	15 (42)
1	9 (25)
2 – 3	12 (33)

The APP items, kneeling, squatting, walking on different surfaces, and climbing, were those with the highest percentages of elderly who showed some problem when related to age, sex, falls, and comorbidities. One hundred percent of women in the sample showed difficulty in performing the tasks of kneeling and squatting, as well as the elderly who experienced two to three falls, and who had two to four comorbidities (Table 3).

Table 2 - Profile of activities and participation (APP) related to the mobility of the elderly sample (n = 36), expressed by the mean score

APP items	Mean score x (±)	Score Min - Max	Interpretation
1. Sitting	0 (0)	0-1	No problem
2. Lying down	0 (0)	0-1	No problem
3. Roling over			
3.1. To the right	0 (1)	0-2	No problem
3.2 To the left	0 (1)	0-2	No problem
4. Transferring oneself while lying down			
4.1. To the right	0 (0)	0-1	No problem
4.2 To the left	0 (1)	0-2	No problem
5. Crawling	1 (1)	0-2	Mild problem
6. Kneeling	1 (1)	0-3	Mild problem
7. Bending	0 (0)	0-1	No problem
8. Transferring oneself while sitting	0 (0)	0-1	No problem
9. Standing	0 (0)	0-1	No problem
10. Squatting	1 (1)	0-3	Mild problem
11. Kicking	0 (0)	0-1	No problem
12. Pushing with lower extremities	0 (0)	0-1	No problem
13. Walking short distances	0 (0)	0-1	No problem
14. Walking long distances	1 (1)	0-3	Mild problem
15. Walking on different surfaces	1 (1)	0-2	Mild problem
16. Walking around obstacles	1 (1)	0-2	Mild problem
17. Climbing	1 (1)	0-2	Mild problem
18. Moving around within the home (internal area)	0 (0)	0-1	No problem
19. Moving around within buildings other than home (external area)	0 (1)	0-3	No problem
20. Moving around outside the home and other buildings	0 (1)	0-3	No problem
21. Using private transportation	0 (1)	0-2	No problem
22. Using public transportation	1 (1)	0-3	Mild problem
23. Driving motorized vehicles	0 (0)	0-0	No problem

The personal factors of the sample showed that the profile scores worsened significantly for the factors: age (elderly over 70 years old), sex (female), presence of comorbidity (two to four), and episodes of falls (two to three) (Table 4). The comorbidities found were mainly chronic diseases, and the most frequent diagnoses were in the following order: systemic arterial hypertension, diabetes mellitus, arthrosis, and labyrinthitis.

The association between falls and performance in the APP revealed that elderly who fall at least once are almost 13 times more likely to have mild difficulty in the mobility-related APP (X2, p-value = 0.009*; odds ratio = 12.7; Kappa = 0.374; sensitivity = 0.476; specificity = 0.933; positive predictive value= 0.909 and negative predictive value = 0.56).

Table 3 - Percentage of elderly with problems in the items of the activities and participation profile (APP) regarding the variables related to personal and clinical factors

APP items	Age[a]			Sex[b]		Falls[c]		Number of falls[d]			Comorbities[e]	
	60-69[1]	70-79[2]	>80[3]	F	M	Sim	Não	0	1	2-3	0-1	2-4
1	0	20	33	18	0	19	7	7	11	25	6	21
2	7	27	33	25	0	29	7	7	22	33	6	32
3.1	20	40	33	36	13	43	13	13	11	67	12	47
3.2	20	27	33	29	13	38	7	7	11	58	12	37
4.1	27	40	50	36	38	48	20	20	11	75	29	42
4.2	33	27	50	32	38	48	13	13	11	75	29	37
5	20	80	83	57	50	57	53	53	44	67	41	68
6	87	93	83	100	50	95	80	80	89	100	76	100
7	20	27	50	29	25	43	7	7	44	42	29	26
8	13	27	50	25	25	38	7	7	44	33	12	37
9	20	33	50	32	25	38	20	20	22	50	29	32
10	87	93	83	100	50	95	80	80	89	100	76	100
11	0	20	33	18	0	24	0	0	11	33	6	21
12	13	20	50	29	0	33	7	7	22	42	24	21
13	0	13	50	14	13	19	7	7	11	25	12	16
14	20	47	83	50	13	52	27	27	44	58	29	53
15	47	80	83	75	38	67	67	67	56	75	53	79
16	27	60	67	57	13	52	40	40	22	75	35	58
17	53	80	67	79	25	76	53	53	67	83	47	84
18	0	13	33	14	0	19	0	0	11	25	6	16
19	7	13	67	36	0	38	13	13	22	50	12	42
20	13	40	67	43	0	48	13	13	33	58	12	53
21	13	47	67	43	13	48	20	20	33	58	18	53
22	40	67	67	68	13	71	33	33	56	83	41	68
23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
$\overline{X}$ (±)	24 (24)	43 (26)	57 (18)*	44 (25)*	19 (17)	47 (21)*	25 (25)	25 (25)	33 (24)	58 (23)*	27 (20)	48 (25)*

Note: Variable does not follow normal distribution. Kruskal-Wallis test, post-hoc Newman-Keuls: : [a]p < 0.001 - 1 vs 2 (p = 0.012) 1 vs 3 (p < 0.0001) and 2 vs 3 (p = 0.028); [d]p < 0,001 - 1 vs 3 (p < 0.0001) and 2 vs 3 (p = 0.002). Mann-Whitney test: [b]p = 0.0003; [c]p = 0.001; [e]p = 0.002. APP items: 1 = sitting; 2 = lying down; 3.1= rolling over to the right; 3.2 = rolling over to the left; 4.1 = transferring oneself while lying down to the right; 4.2 = transferring oneself while lying down to the left ; 5 = crawling; 6 = kneeling; 7 = bending; 8 = transferring oneself while sitting; 9 = standing; 10 = squatting; 11 = kicking; 12 = pushing with lower extremities; 13 = walking short distances; 14 = walking long distances; 15 = walking on different surfaces; 16 = walking around obstacles; 17 = climbing; 18 = moving around withing the home (internal area); 19 = moving around within buildings other than home (external area); 20 = moving around outside the home and other buildings; 21 = using private transportation; 22 = using public transportation; 23 = driving motorized vehicles.

Table 4 - Mean sum of activities and participation (APP) scores for the variables related to personal factors in the sample (n = 36 elderly)

Personal factors	APP (sum of scores) $\overline{X}$ (±)	ǂp-value
Age (years)[a]		
60 - 69	6.2 (5)[1]	0.045*
70 - 79	13.3 (12)[2]	
> 80	18.1 (14)[3]	
Sex		
Female	13.0 (11)	0.022*
Male	4.4 (5)	
Education (years)		
1 - 4	12.6 (11)	0.149
5 - 7	7.9 (8)	
Occupation		
Retired	12.6 (12)	0.273
Housewife/formal or informal work	7.3 (6)	
Comorbities		
0 - 1	8.0 (9.6)	0,031*
2 - 4	14.1 (11.2)	
Falls		
Yes	14.6 (12)	0.037*
No	6.4 (5)	
Number of falls[b]		
0	6.4 (5)[1]	0.015*
1	9.9 (11)[2]	
2 - 3	18.7 (13)3	

Note: Variable does not follow normal distribution. Kruskal-Wallis test, post-hoc Newman-Keuls. [a]1 vs 2 (p = 0.046) and 1 vs 3 (p = 0.033); [b]1 vs 3 (p = 0.005) and 2 vs 3 (p = 0.047).

Discussion

The profile of activities and participation in the present study revealed that the elderly presented problems classified as mild in activities such as: crawling, using public transportation, and walking (either over long distances or avoiding obstacles), particularly in kneeling, squatting, climbing, and walking on different surfaces, which comprised the largest number of elderly with problems. A mild problem in executing these tasks may be related to the gradual loss of musculoskeletal mass and strength that happens with advancing age, which has a significant impact on performance of these activities and may lead to additional consequences, such as loss of balance, reduced mobility, and increased risk of falling, thus reducing the autonomy of the elderly.[6]

The fact that the population studied in this research was physically inactive may have impacted mainly the APP items that are more related to strength and walking. In the study by Silva et al.,[1] most of the physically inactive elderly, even those classified as independent, showed a much lower functional performance than those who practiced physical activities in the Time Up and Go (TUG) mobility test. Difficulty with walking is an important measure of motor impairment among the elderly. Those who report difficulty walking two to three blocks in their neighborhood, a standard measure of mobility impairment, are in worse health and have lower levels of overall functioning than those who report no such difficulty.[17]

Other factors that may be correlated with the findings are the architectural obstacles, conceptualized as environmental factors, which can be found on streets, transportation, public places, and even in the houses themselves. The independent and safe dislocation of the elderly requires an adequate physical environment that facilitates accessibility.[18] Sometimes it is necessary to walk long distances, as well as to go up and down several steps to access public transportation, which can be physical barriers that discourage them from leaving home.[19]

Interestingly, the driving motor vehicles item received a score of 9 (not applicable) from 89% of the participants. Clearly, many older adults experience driving anxiety and self-limit their driving with age or development of physical limitations.[11] Data such as these can provide insight into the limitations and needs of the elderly, while identifying the presence of problems that are significant to mobility.[20]

Data such as these can provide insight into the limitations and needs of the elderly, while identifying the presence of problems that are significant to mobility.[20] When limitations in these steps begin to emerge, the participation in activities of daily living is more difficult and living safely in one's own home environment can be challenging.[21]

Although the activities and participation were not classified as moderate, severe, or complete problems in this study, a mild problem for execution of tasks, where

scores range from no problem to a severe problem within this classification, has already made the elderly eligible for intervention strategies, focusing on improving the level of capacity/performance and seeking to maintain them as long as possible in an autonomous capacity.[22]

The findings of this study also indicate that the main factors related to the emergence of problems in the APP that affect the functioning of the elderly are: age, especially those aged 70 years or more, sex (female), presence of multicomorbidities, and history of falling.

Unfortunately, the execution of essential activities can become a challenge for many older adults, serving as a warning to those who already struggle with these tasks, for reasons such as advanced age, limited range of motion, reduced lower extremity strength, and decreased balance.[20,23]

Evidence suggests that lower limb muscle strength in the 80-year-old group is up to 27% lower when compared to the 60-year-old group.[24] The characteristics of this study, however, did not allow quantifying the level of strength and other variables. The study conducted by Nunes et al.[25] demonstrated a relationship between increasing age and the prevalence of difficulty in the performance of daily activities, associating a worse functional performance with advancing age, corroborating the findings of our study and of the study by Beard et al.,[26] developed in high, medium and low income countries.

Our study also indicated the consistency of a recurrent profile in research in the Brazilian context, with a predominance of females (78%), characterizing a process known in gerontology as the feminization of old age. Some of the explanations for this phenomenon are due to women's tendency to have a lower-risk job, lower percentages of violent deaths (accidents and murders), less alcohol and tobacco consumption, and a greater concern with their own health, with more positive attitudes towards self-care.[1]

Regarding functioning, in general, women present higher levels of problems, as confirmed in the APP when compared to men.[1,27] The study by Pinheiro et al.[24] showed that elderly women presented functional decline with age, especially in aspects related to mobility and flexibility, corroborating our findings in which 100% of the women had difficulty in completing the tasks of kneeling and squatting.

A study with a sample composed of 63.1% elderly women with characteristics similar to those of the present study showed that the most difficult tasks to execute were bending over, kneeling, and squatting, which were associated with reduced strength and muscle power.[28] A study evaluating the effect of 12 weeks of an exercise program containing free squats (sumo, lunge squat) showed an improvement in strength and muscular resistance of the lower limbs and promoted the improvement of physical fitness related to health in elderly women, making this type of exercise indispensable in the daily life of womens.[29]

Aging is not necessarily related to diseases and disabilities, but chronic diseases have been replacing acute diseases. Studies have shown that multiple morbidities in these individuals are associated with higher morbidity and mortality among the elderly and high dependency rates.[30,31] The results of this study demonstrated that chronic diseases have a strong influence on the functioning of the elderly. Moreover, there is a higher risk of developing chronic and degenerative diseases in individuals over 75 years of age, decreasing their ability to have an independent life and active aging.[1]

According to the study by Alves et al.[30] the presence of comorbidities is detrimental to the functional capacity of the elderly. Arterial hypertension increases the chance of the elderly to be dependent in basic activities of daily living by 39%, while heart disease, arthropathy, and pulmonary disease increase it by 82%, 59% and 50%, respectively. The chance of dependence in activities and participation in tasks was more than doubled for the presence of each of these chronic diseases, and physical inactivity is an important risk factor for decline in elderly functional capacity. Gomes Neto and Castro[32] reported that long-term physical activity is related to the delay in the onset of chronic diseases and greater independence of the elderly in performing activities of daily living, showing the importance of staying physically active.

The potential relationship between functioning, history of falls, and presence of comorbidities should be investigated to meet the Global Strategy and Action Plan on Ageing and Health, according to the WHO.[33] Risk of falling increases as the number of risk factors increases; it starts at 8% with no risk factors and increases up to 78% with four-risk factors.[33]

Women fall more frequently than men; increasing age, especially in individuals aged 80 years and older, the presence of multicomorbidities, polypharmacy, and history of previous falls are risk factors that increase the

possibility of new fall episodes.[33] Among individuals with a recent fall, up to 70% report fear of falling. Of these, 50% may limit or exclude physical or social activity because of this fear, therefore increasing the risk of falling.[33,34]

Studies developed by Pinheiro et al.[24] and Alves et al.[30] showed that a greater need for assistance in activities of daily living is associated with an increased risk of falls. One study reported that those who had history of falls and could not get up without help were more likely to experience functional decline than those who had no history of falls or who had a history of falls but could get up without help.[35]

When the event of falls was related to the performance in the APP, the elderly who had already experienced at least one episode of falling were almost thirteen times more likely to have mild difficulty in performing activities, negatively impacting functioning and highlighting the importance of assessing functional impairment, especially in the older population with a history of falling.

As the main limitation of this study, we point to the type of sample (intentional, non-probabilistic) and sample size, affected by operational difficulties due to the beginning of the COVID-19 pandemic in Brazil. The assessment of motor performance, as part of the functional assessment of the elderly, can improve the quality of health diagnosis of these individuals. The study participants live in the Zona da Mata area, Pernambuco state, which can generate a possible bias in the lifestyle habits of the population.

The ICF has proven to be an adequate tool to guide care, especially in old age. The APP based on the ICF, even though it is a tool widely disseminated in the country, is not yet part of routine clinical practice of many professionals. The method of scoring and the significant number of items are the major difficulties found when administering the instrument.

Despite the stated limitations, the results of the present study provide scientific evidence on factors that can interfere in activities and participation of elderly people. Professionals working in gerontology need to include activities of squatting, kneeling, climbing, and walking with different variations in their care protocols to improve functional capacity. Our findings can also contribute to the development of future prevention strategies and provide a basis for planning and implementing public policies to improve functional status and quality of life of the elderly population.

Conclusion

Regarding functional status of the physically inactive elderly assessed by the APP, it was possible to verify that most presented mild problems for the items that were more related to strength and walking (crawling, kneeling, squatting, walking long distances, walking on different surfaces, walking around obstacles, climbing, and use of public transportation). Kneeling, squatting, walking on different surfaces, and climbing items corresponded to the highest percentages of elderly who presented some problem.

Among the personal factors, age above 70 years, female sex, episodes of falls, and comorbidities were significantly associated with reduced or impaired functional status. The importance of maintaining functional status is emphasized in order to preserve activities and participation during the aging process. It is important to understand the functional profile of the population, to implement strategies and develop programs that minimize, improve, and prevent the emergence of factors that can result in the loss of independence and autonomy of the elderly.

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Authors' contributions

All the authors contributed substantially to the design of this manuscript. CMMN was responsible for all the steps of the article, namely: literature review, study conception and design, data collection and interpretation, article writing, and approval of the final version to be published. APSO, LOL and ARL contributed to the conception, data collection, interpretation, critical review of the article, and approval of the final version. MGWSC, advisor of the thesis from which the article originated, was responsible for conception, study design, and statistical analysis. Together with

the dissertation's co-supervisor, CCSAL, she was also responsible for the critical analysis of the manuscript, organizing the methodological process, correcting and analyzing all the different steps.

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