

# Disability, physical-functional performance, and neighborhood environment: evaluation of community-dwelling older adults based on the International Classification of Functioning, Disability, and Health

*Incapacidade, desempenho físico-funcional e ambiente de vizinhança: avaliação de idosos comunitários com base na Classificação Internacional de Funcionalidade, Incapacidade e Saúde*

*Discapacidad, desempeño físico-funcional y ambiente del barrio: evaluación de ancianos residentes en comunidad a partir de la Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud*

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**ABSTRACT** | The International Classification of Functioning, Disability, and Health (ICF) is still a distant and often feared tool in the area of older adults health. This study aimed to describe the inabilities to perform activities of daily living (ADLs), limitations in the physical-functional performance, and the perception of the surrounding environment in community-dwelling older adults from the extreme South of Santa Catarina, classifying them according to the domains and qualifiers proposed by the ICF. This is a cross-sectional study, with older adults of both sexes. The analyzed variables were classified and categorized according to the ICF: (1) Body Functions and Structures: physical-functional performance tests; (2) Activity and Participation: ADL self-assessment instrument; and (3) Environmental factors: self-perception of the surrounding environment. A total of 308 older adults were evaluated, most of them were women (57.8%) and aged 60–69 years (54.7%). There were higher prevalence of moderate/severe difficulty in the 5-times sit-to-stand test (5TSTS) (66.2%), of moderate/severe disability in the activity of cutting toenails (21.2%), and no reports of places for the practice of physical activity near the residence (72.5%). As for the ICF qualifiers, there was greater “moderate/

severe difficulty” for the 5TSTS in the “Body Function and Structure” categories and in the task of cutting toenails in the “Activity and Participation” categories. In the category “Environmental factors,” there was a higher prevalence of lack of places for physical activity in the neighborhood.

**Keywords** | International Classification of Functioning, Disability and Health; Physical Functional Performance; Aging.

**RESUMO** | A Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF) ainda é uma ferramenta distante e muitas vezes temida na área da saúde do idoso. Diante disso, o objetivo deste estudo foi descrever a incapacidade nas atividades da vida diária (AVDs), as limitações no desempenho físico-funcional e a percepção do ambiente de vizinhança em idosos comunitários do extremo sul de Santa Catarina, classificando-os segundo os domínios e qualificadores propostos pela CIF. Tratou-se de estudo transversal realizado com idosos de ambos os sexos. As variáveis analisadas foram categorizadas de acordo com os domínios da CIF: (1) funções e estruturas do corpo: testes de desempenho físico-funcional; (2) atividade e participação: instrumento de autoavaliação das AVDs; e (3)

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fatores ambientais: autopercepção do ambiente de vizinhança. Foram avaliados 308 idosos, sendo a maioria mulheres (57,8%) e com idade entre 60 e 69 anos (54,7%). Considerando os qualificadores da CIF, verificou-se maior dificuldade moderada/grave para o teste de sentar e levantar da cadeira de 5 repetições (TSLC5R) (66,2%) no domínio “função e estrutura do corpo”, enquanto para o domínio “atividade e participação” observou-se a prevalência de incapacidade moderada/grave para a tarefa de cortar as unhas dos pés (21,2%). No domínio “fatores ambientais”, verificou-se o predomínio de ausência de locais para a prática de atividade física no ambiente de vizinhança (72,5%).

**Descritores** | Classificação Internacional de Funcionalidade, Incapacidade e Saúde; Desempenho Físico-Funcional; Envelhecimento.

**RESUMEN** | La Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud (CIF) es todavía una herramienta lejana y, muchas veces, temida en el área de la salud del adulto mayor. Ante esto, el objetivo de este estudio fue describir la discapacidad en las actividades de la vida diaria (AVD), las limitaciones en el desempeño físico-funcional y la percepción del barrio en ancianos que viven en comunidad en el extremo

sur de Santa Catarina (Brasil) al clasificarlos según los dominios y calificadores propuestos por la CIF. Se trata de un estudio transversal, en el que participaron ancianos de ambos sexos. Las variables fueron categorizadas según los dominios de la CIF: (1) funciones y estructuras corporales: pruebas de desempeño físico-funcional; (2) actividad y participación: instrumento de autoevaluación de AVD; y (3) factores ambientales: autopercepción del entorno del barrio. Del total de 308 ancianos participantes, la mayoría eran mujeres (57,8%), con edades entre 60 y 69 años (54,7%). Considerando los calificadores de la CIF, hubo una mayor dificultad moderada/severa para el test de sentarse y levantarse de una silla durante 5 repeticiones (TSL5R) (66,2%) en el dominio “función y estructura corporal”, mientras que para el dominio “actividad y participación” predominó la prevalencia de discapacidad moderada/grave para la tarea de cortar las uñas de los pies (21,2%). En el dominio “factores ambientales”, hubo predominio de la ausencia de locales para practicar actividad física en el entorno del barrio (72,5%).

**Palabras clave** | Clasificación Internacional del Funcionamiento, de la Discapacidad y de la Salud; Rendimiento Físico Funcional; Envejecimiento.

## INTRODUCTION

In 2001, the World Health Organization (WHO) published the International Classification of Functioning, Disability, and Health (ICF) aimed to unify the categories that describe the functioning and disabilities of an individual, considering their health condition. The ICF domains, using a standardized language, allows for the classification of the various factors that contribute to the biopsychosocial aspect of health<sup>1,2</sup>.

The domain “Body Functions and Structures” includes the variables related to physical and functional performance, which are commonly impaired due to aging and are associated with increased risk of falls, institutionalization, morbidities, and higher risk of mortality<sup>3</sup>. In the domain “Activity and Participation,” the variables related to activities of daily living (ADL) are addressed, which have been suggested as important markers of functional health among the older adults who do not perform them independently<sup>4,5</sup>. The domain “Environmental Factors” comprises the external conditions, i.e., the characteristics of the environment in which the person is inserted, including the area surrounding the residence. The literature indicates that these aspects

may be important risk factors for low quality of life and lower longevity<sup>6</sup>.

Several physical tests and instruments are used to assess skills related to functioning and disability in older adults, as well as to identify environmental factors that may be related to these outcomes<sup>7-9</sup>. When using these instruments, however, most studies do not present their classifications according to the domains and qualifiers proposed by the ICF, which is still little discussed and used, both in the scientific and clinical practice. Probably, researchers’ unfamiliarity with these domains and qualifiers has been limiting the use of the ICF, which is still a distant and often feared tool in the field of Geriatrics. Thus, this study can help health professionals to understand and to employ the ICF in their research, as well as in the evaluation process of older adults in their clinical practice.

Therefore, this study aims to describe the inabilities to perform ADL, the limitations in physical-functional performance, and the perception of the surrounding environment in community-dwelling older adults from the Southernmost region of the state of Santa Catarina, classifying these factors according to the domains and qualifiers proposed by the ICF.

## METHODOLOGY

This cross-sectional and home-based study was conducted with older adults (60 years or older) of both sexes. The sample presented in this article is part of an umbrella-project called *Influência do nível de atividade física em testes de desempenho físico-funcional em idosos comunitários* (Influence of the level of physical activity and physical-functional performance tests on the older community). This study aimed to characterize the older adults within the community who used the Primary Care service and to evaluate their living and health conditions.

The municipality Balneário Arroio do Silva, where the research was carried out, is located in the Southernmost region of the state of Santa Catarina, Brazil. The total resident population, according to the last Demographic Census data, was 9,586 inhabitants, among which 14.8% were older adults<sup>10</sup>. According to the United Nations Development Program, the Municipal Human Development Index (MHDI) was 0.746, which places this municipality in the high development range, with longevity being the dimension that most contributed to its position (0.858)<sup>11</sup>.

The calculation for finite samples was performed based on the total number of older adults registered in the Municipal System of Strategic Health Management ( $n=2,833$ ) in the three Basic Health Units (UBS) of the municipality. The estimated prevalence for unknown outcomes was 50%, with an error of five percentage points and 95% confidence interval (95% CI). A total of 540 eligible older adults was estimated after an additional 20% was added to account for expected losses. The selection of the older adults was performed by a random draw, considering a representative proportion of older adults registered in each UBS.

Those who were residents in long-term care institutions and had changed their address and those who were not able to answer the questionnaires, that is, those who did not demonstrate communicative and/or cognitive capacity when contacted, were excluded from the sample. Those who were not located in their homes after three attempts on different days and times, and those who did not agree to participate in the study (refusals) were considered as losses. Data collection was performed from September 2018 to June 2019, during visits to the selected older adults.

To contemplate the objective of the research, the biopsychosocial model of ICF was used as a conceptual structure, as described below.

- **Body Functions and Structures:** includes physical-functional performance tests: (1) tandem

stance (TS)<sup>12</sup>, which assesses body stability when standing. The participants were categorized considering the duration of their test, according to the qualifications proposed by the ICF, as having: no difficulty (0–4%), those who performed the test between 30.00 and 26.71 seconds; mild difficulty (5–24%), those who performed it between 26.53 and 17.69 seconds; moderate/severe difficulty (25–95%), those who completed the test between 17.59 and 1.13 seconds; and complete difficulty (96–100%), those who were totally dependent or had any impediment to perform the test. (2) The five times sit-to-stand test (5TSTS), which indirectly assesses the muscle strength of the lower limbs<sup>13</sup>. The participants were categorized as having: no difficulty (0–4%) when they completed the test between 3.75 and 8.45 seconds; mild difficulty (5–24%) when they completed between 8.47 and 11.56 seconds; moderate/severe difficulty (25–95%) when they completed the test between 11.65 and 49.47 seconds; and complete difficulty (96–100%) for those who were totally dependent or had any impediment to complete the test.

- **Activity and Participation:** the inability to perform ADL was assessed using the Brazilian OARS multidimensional functional assessment questionnaire (BOMFAQ), translated into and validated for the Brazilian older adult population. The questionnaire assesses the degree of difficulty in performing 14 ADLs<sup>14</sup>. The participants were categorized, according to the qualifications proposed by the ICF, as having: no difficulty (0–4%), when they reported not having difficulty performing ADL; mild difficulty (5–24%), when they reported some difficulty in performing ADL; moderate/severe difficulty (25–95%), when they reported great difficulty in performing ADL; and complete difficulty (96–100%), when they reported being unable to perform ADL. The “moderate” and “severe” qualifiers were grouped to adapt and to standardize the alternative responses obtained by the instruments and the physical-functional tests.
- **Environmental Factors:** the surrounding environment was evaluated by the abbreviated neighborhood environment walkability scale (A-NEWS)<sup>15</sup>, translated<sup>16</sup> into and validated for the Brazilian population<sup>17</sup>, which investigates self-perception regarding infrastructure (sidewalks, green and leisure areas, hills, waste, and open

sewage); traffic (safety and pollution); and general safety (lighting and security to walk) in places near the residence. The dichotomous response provided by the instrument (presence or absence) are not qualifiable according to the ICF, presented as absolute and relative frequencies.

- **Personal Factors:** the following aspects were considered for the characterization of the sample: age group (60–69 years; 70–79 years; 80 years or more); sex (female; male); marital status (married/with partner; single/divorced; widowed); years of study (0–4 years; 5–8 years; 9 years or more); and self-reported skin color (white; mixed-race; others).

The following are the descriptive analyses performed in Stata software (version 14.0), with raw values and percentages.

## RESULTS

Among the 540 eligible older adults, 24 were excluded due to deaths, 68 for losses, 64 for change of address,

16 for exclusions, 29 for refusals, and 31 for incomplete records, totaling 308 older adults interviewed. There was a predominance of older adults aged 60–69 years (54.7%), female (57.8%), married/with a partner (59.1%), with up to four years of schooling (48.4%), self-reported as white (73.4%).

The results of the domain “Body Functions and Structures” (Table 1) showed a higher prevalence of moderate/severe difficulty in 5TSTS (66.2%). On the other hand, complete difficulty was observed during the TS only in 11.7% of the participants, and the majority did not have difficulty in performing the test (61.7%).

Regarding the “Activity and Participation” domain (Table 2), there was a prevalence of complete difficulty in the activities of cutting toenails (12.0%) and house cleaning (9.5%). For moderate/severe difficulty, a higher prevalence was observed in the activities of cutting toenails (21.2%) and climbing a flight of stairs (19.9%); whereas, for eating and caring for their appearance, most participants reported having no difficulty, with 93.5% and 85.4% respectively.

Table 1. Description of the category “Body Function and Structure” of the International Classification of Functioning, Disability, and Health

Physical-functional performance test	ICF category	No difficulty N (%)	Mild difficulty N (%)	Moderate/ severe difficulty N (%)	Complete difficulty N (%)
TS (s)	b2351	190 (61.7)	0 (0)	82 (26.6)	36 (11.7)
5TSTS (s)	b7303	15 (4.9)	61 (19.8)	204 (66.2)	28 (9.1)

\*TS: tandem stance; 5TSTS: five times sit-to-stand test; s: seconds.

Table 2. Description of the “Activity and Participation” domain of the International Classification of Functioning, Disability, and Health

Assessment tool BOMFAQ	ICF category	No difficulty N (%)	Mild difficulty N (%)	Moderate/ severe difficulty N (%)	Complete difficulty N (%)
Lie down/get out of bed	d410	209 (67.9)	76 (24.7)	22 (7.1)	1 (0.3)
Eating	d550	288 (93.5)	15 (4.9)	5 (1.6)	0
Taking care of appearance	d520	263 (85.4)	34 (11.0)	11 (3.6)	0
Walking on the plane	d450	260 (84.4)	32 (10.4)	15 (4.9)	1 (0.3)
Bathing	d510	261 (84.7)	27 (8.8)	18 (5.8)	2 (0.7)
Getting dressed	d540	221 (72.0)	63 (20.5)	21 (6.8)	2 (0.7)
Going to the bathroom, when you feel like it, on time	b620	263 (85.4)	31 (10.1)	13 (4.2)	1 (0.3)
Climbing a flight of stairs	d4551	151 (49.2)	84 (27.4)	61 (19.9)	11 (3.6)
Taking your medicines on time	d570	232 (75.3)	48 (15.6)	22 (7.1)	6 (2.0)
Walking close to home	d460	261 (84.7)	30 (9.7)	9 (2.9)	8 (2.6)
Going shopping	d620	244 (79.2)	28 (9.1)	21 (6.8)	15 (4.9)
Preparing meals	d630	263 (85.4)	25 (8.1)	11 (3.6)	9 (2.9)
Cutting toenails	d5204	135 (44.0)	70 (22.8)	65 (21.2)	37 (12.0)
Taking the bus or taxi	d470	189 (61.6)	65 (21.2)	47 (15.3)	6 (1.9)
House cleaning	d640	173 (56.9)	66 (21.7)	36 (11.8)	29 (9.5)

BOMFAQ: Brazilian OARS Multidimensional Functional Assessment Questionnaire.

Table 3 shows the prevalence in the category “Environmental Factors.” Regarding their dwelling, 72.5% of the participants reported absence of gyms/weight training venues and/or private clubs; 63.2% reported absence of parks, squares, walking trails, and sports courts; and 61.6% did not have access to gyms/equipment for outdoor physical activity near their homes. Regarding the conditions of the streets near the household, 52.4%

did not have access to sidewalks on the streets, 59.9% reported poor sidewalk conditions, and 55.9% reported absence of green areas. Regarding traffic, 74.7% of the participants reported no pedestrian crossings, signs, or walkways near their residence. As for security, 69.5% of the participants reported it was not safe to walk alone in their neighborhood at night, and 60.9% reported that there was no high level of crime in their neighborhood.

Table 3. Sample description according to the category “Environmental Factors” of the International Classification of Functioning, Disability, and Health

A-NEWS domain	Yes N (%)	No N (%)
Category e520 – Services, systems, and policies related to the planning of open spaces		
Supermarket, convenience store/grocery store, farmer’s market	259 (84.1)	49 (15.9)
Shops	139 (45.1)	169 (54.9)
Food establishments	210 (68.2)	98 (31.8)
Health and community centers	185 (60.3)	122 (39.7)
Bus stop	262 (85.1)	46 (14.9)
Parks, squares, hiking trails, bike paths, and/or sports courts	113 (36.8)	194 (63.2)
Gyms/outdoor fitness equipment (Older Adult fitness center)	118 (38.4)	189 (61.6)
Use of the outdoor fitness center (Older adult fitness center)	20 (16.9)	98 (83.1)
Gyms/weight training venues and/or private clubs	82 (27.5)	216 (72.5)
Category e530 – Services, systems, and policies related to utilities		
Sidewalks on most streets	146 (47.6)	161 (52.4)
Maintenance of sidewalks	122 (40.1)	182 (59.9)
Green area	135 (44.1)	171 (55.9)
Flat streets	256 (83.4)	51 (16.6)
Waste accumulation and/or places with open sewage	69 (22.5)	238 (77.5)
Category e540 – Transport-related services, systems, and policies		
Traffic as an obstacle for walking or cycling	48 (15.6)	260 (84.4)
Pedestrian crossings, signs, or walkways	78 (25.3)	230 (74.7)
Drivers respect the crosswalk	41 (60.3)	31 (39.7)
Category e570 – Social security-related services, systems, and policies		
Street lighting	262 (85.6)	44 (14.4)
Security during the day to walk	262 (85.3)	45 (14.7)
Security during the night to walk	93 (30.5)	212 (69.5)
High level of crime	120 (39.1)	187 (60.9)

\*A-NEWS: abbreviated neighborhood environment walkability scale.

## DISCUSSION

The main results of this study showed a higher prevalence of moderate/severe or complete difficulty in the tasks of cutting toenails and cleaning the house in the category “Activities and Participation.” In the category “Body Function and Structure,” most participants had moderate/severe

difficulty in the test that indirectly evaluated muscle strength. In the category “Environmental Factors,” most participants reported having little access to gyms, parks, and squares, as well as precarious conditions of streets and sidewalks and a sense of insecurity in their neighborhood.

In the category “Functions and Structures of the Body,” the highest prevalence of moderate/severe

difficulty was observed for the 5TSTS test. On the other hand, the static body balance test, evaluated via TS, showed that most participants had no difficulty in its performance. These findings demonstrate that, for this sample, muscle strength was more impaired when compared to static balance. Hagen et al.<sup>18</sup> found that a decrease in muscle strength of the lower limbs contributes to balance impairment, this relationship, however, still needs to be further analyzed. In other studies, in which the same tests were applied in an older adults population, Granacher, Muehlbauer, and Gruber<sup>19</sup> strongly recommended the use of tests that assess the power and muscle strength of the lower limbs—such as the 5TSTS—since they are associated with the performance of daily activities. Both tests used in this study to verify the body functions and structure are similar to the ADL performed by older adults, such as the 5TSTS test, which represents the task of sitting and standing from a chair<sup>19</sup>; on the other hand, the TS test simulates the act of climbing and descending a step of stairs or walking, as it indirectly requires them to lean on a single leg for its performance<sup>20</sup>. The impairment of bodily functions is considered as a disability, and changes to it may reflect on other ICF categories, such as limiting social participation<sup>21</sup>.

It is important to highlight that, within the literature, these tests present cut-off points to classify their respective alteration<sup>12,13</sup>, making it difficult to establish a reliable comparison with our prevalence, which are based on the ICF qualifiers. The study by Gschwind et al.<sup>22</sup> used the 5TSTS test to evaluate the effectiveness of lower-limbs power and strength training, considering the following cut-off points: insufficient strength performance ( $\geq 16.7$ s), sufficient (13.7s to 16.6s), good (11.2s to 13.6s), and very good ( $\leq 11.1$ s), similar to the qualification used in this study, in which the time of approximately 11 seconds discriminated the presence of moderate/severe difficulty for the other qualifications. It is also noteworthy that, according to the European Consensus of Sarcopenia<sup>23</sup>, times equal to or greater than 15 seconds in the 5TSTS reveal probable sarcopenia in older adults, which falls into the moderate/severe difficulty category in this study, favoring the use of the categorization of this test via the qualifiers of the ICF.

Regarding the “Activity and Participation” domain (Table 2), there was a prevalence of complete difficulty in the activities of cutting toenails (12.0%) and house cleaning (9.5%). Similarly, in a study conducted with 1,750 older adults from Minas Gerais who were assisted by the Family Health Strategy team, Soares et al.<sup>24</sup>, observed a higher

prevalence of great difficulty in cutting toenails and house cleaning. Few studies have investigated the prevalence of difficulties for these activities in isolation, being usually presented together with other activities in the category of instrumental activities of daily living (IADL). Even so, the inability to perform IADLs is usually assessed by the report of little/too much difficulty to perform at least one task and, in general, has been higher in relation to basic activities of daily living (BADL), as demonstrated in the study by Schmidt et al.<sup>25</sup>, containing representative data from 23,815 older adults in Brazil. In this study, a prevalence of 29.1% was found for the inability to perform IADLs, whereas 15.8% was found for ADL. It is known that instrumental activities involve more complex skills for their performance, such as preserved physical and cognitive abilities, which usually degenerate earlier in the aging process<sup>26</sup>. Notably, factors such as the inability or severe difficulty in performing ADLs are associated with a higher risk of frailty, depression, worse quality of life, cognitive impairment, and mortality<sup>27-30</sup>. Therefore, the importance of standardizing its categorization through the ICF is justified, which would allow to establish more reliable comparisons of prevalence among studies evaluating the older adult population.

In the category “Environmental Factors,” the results indicated that the surrounding environment of the participants had few places in which they could practice physical activity, in addition to presenting uncared-for sidewalks. These barriers can restrict the access and motivation, contributing to inactivity, leading to functional limitations and disabilities<sup>27,31-33</sup>. Thus, the surrounding environments should be considered in the development of preventive and rehabilitative strategies for the older adult population<sup>28,29</sup>. Neighborhood security is also important for the well-being of the older adults, since the feeling of insecurity lead to less possibilities to leave the house, which increases the risk of immobility and social isolation<sup>30</sup>.

In the study by Chaudhury et al.<sup>34</sup>, it was evidenced that the environmental context has the potential in either support the practice of physical activity in older adults or lead to deficiencies in the functions and structures of the body. This finding also corroborates what was observed by Liu<sup>21</sup> and Wong, Yu, and Woo<sup>35</sup>, highlighting that the physical environment and the social environment of the neighborhood affect the health of older adults. Moreover, we observed that most of the older adults reported that it is not safe to walk at night. According to Cramm and Nieboer<sup>36</sup>, neighborhood security is important for the well-being

of community dwelling older adults, and those who do not feel safe are less likely to leave home and they may show negative relationship in other categories of ICF, such as higher risk of immobility, social isolation, depression, and a limited amount of physical activity<sup>37</sup>.

Moreover, although the ICF does not yet have qualifiers for the “Environmental Factors” domain, it is worth highlighting the importance of studying them in relation to the health of older adults, especially when dealing with characteristics that involve the surrounding environment, which increasingly stand out as potential risk factors for several negative outcomes, such as general mortality, mortality due to chronic condition or prevalence of diseases, mental health outcomes (depression, cognitive decline), and health behaviors (e.g., diet and physical activity)<sup>38</sup>. Therefore, an individual’s intrinsic characteristics alone are not sufficient to explain all the causes of health problems; it is necessary to distinguish the characteristics of the surrounding environment associated with the biopsychosocial model of the ICF, as this allows to strongly sustain the creation and/or improvement of health policies<sup>39</sup>.

One of the main positive points of this study is considered to be the stimulation of knowledge and applicability of ICF through the presentation of its classifications and its valorization as an instrument of international support. Additionally, we highlight the fact that each instrument used investigated activities and fundamental skills for the maintenance of the health of the older adult population. However, this research has some limitations. Although the representative calculation of the older adults was performed, the results cannot be extrapolated to the entire Brazilian population of older adults, due to the particularities of each region. Moreover, subjective evaluations are not always reliable, as they depend on perception and individual factors that are not controllable in population surveys<sup>32</sup>. Furthermore, we emphasized that the exclusion of older adults who could not answer the BOMFAQ and A-NEWS questionnaires probably reflected in the prevalence values here observed.

Finally, it is believed that studies that aim to describe the factors related to the categories of ICF may encourage its use as a research and clinical approach resource, presenting assessment instruments that can be used and thus allowing better communication and standardization of language among the different professionals who work with the elderly population.

## CONCLUSION

The highest prevalence of moderate/severe difficulty was observed in the 5TSTS for the category “Body Functions and Structures” and in the instrumental activities of daily living for the category “Activity and Participation” of the ICF. In the category “Environmental Factors,” there were more reports of few places for the practice of physical activity, precarious conditions of the streets and sidewalks, insecurity, and crime in the area surrounding their residence.

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## REFERENCES

1. Farias N, Buchalla CM. A classificação internacional de funcionalidade, incapacidade e saúde da Organização Mundial da Saúde: conceitos, usos e perspectivas. *Rev Bras Epidemiol.* 2005;8(2):187-93. doi: 10.1590/s1415-790x2005000200011.
2. World Health Organization. The International Classification of Functioning, Disability and Health. Geneva: WHO; 2001.
3. Tieland M, Trouwborst I, Clark BC. Skeletal muscle performance and ageing. *J Cachexia Sarcopenia Muscle.* 2018;9(1):3-19. doi: 10.1002/jcsm.12238.
4. Campos ACV, Almeida MHM, Campos GV, Bogutchi TF. Prevalência de incapacidade funcional por gênero em idosos brasileiros: uma revisão sistemática com metanálise. *Rev Bras Geriatr Gerontol.* 2016;19(3):545-59. doi: 10.1590/1809-98232016019.150086.
5. Farías-Antúnez S, Lima NP, Bierhals IO, Gomes AP, Vieira LS, Tomasi E. Incapacidade funcional para atividades básicas e instrumentais da vida diária: um estudo de base populacional com idosos de Pelotas, Rio Grande do Sul, 2014. *Epidemiol Serv Saude.* 2018;27(2):e2017290. doi: 10.5123/S1679-49742018000200005.
6. Rantakokko M, Iwarsson S, Mänty M, Leinonen R, Rantanen T. Perceived barriers in the outdoor environment and development of walking difficulties in older people. *Age Ageing.* 2012;41(1):118-21. doi: 10.1093/ageing/afr136.
7. Guralnik J, Bandeen-Roche K, Bhasin SAR, Eremenco S, Landi F, Muscedere J, et al. Clinically meaningful change for physical performance: perspectives of the ICFSR task force. *J Frailty Aging.* 2020;9(1):9-13. doi: 10.14283/jfa.2019.33.
8. Santos GS, Cunha ICKO. Capacidade funcional e sua mensuração em idosos: uma revisão integrativa. *Rev Fam Ciclos Vida Saude Contexto Soc.* 2014;2(3):269-78. doi: 10.18554/refacs.v2i3.1215.

9. Hino AAF, Reis RS, Ribeiro IC, Parra DC, Brownson RC, Fermio RC. Using observational methods to evaluate public open spaces and physical activity in Brazil. *J Phys Act Health*. 2010;7(Suppl 2):S146-54. doi: 10.1123/JPAH.7.S2.S146.
10. Instituto Brasileiro de Geografia e Estatística. Censo Demográfico 2010: características da população e dos domicílios [Internet]. Rio de Janeiro: IBGE; 2011 [cited 2021 Jun 23]. Available from: [https://biblioteca.ibge.gov.br/visualizacao/periodicos/93/cd\\_2010\\_caracteristicas\\_populacao\\_domicilios.pdf](https://biblioteca.ibge.gov.br/visualizacao/periodicos/93/cd_2010_caracteristicas_populacao_domicilios.pdf)
11. Programa das Nações Unidas para o Desenvolvimento. Índice de Desenvolvimento Humano por Municípios [Internet]. Brasília, DF: PNUD; 2010 [cited 2021 Sep 27]. Available from: <https://www.br.undp.org/content/brazil/pt/home/idh0/rankings/idhm-municipios-2010.html>
12. Camara FM, Gerez AG, Miranda MLJ, Velardi M. Capacidade funcional do idoso: formas de avaliação e tendências. *Acta Fisiatrica*. 2008;15(4):249-56.
13. Rikli RE, Jones CJ. Development and validation of a functional fitness test for community-residing older adults. *J Aging Phys Act*. 1999;7(2):129-61. doi: 10.1123/japa.7.2.129.
14. Blay SL, Ramos LR, Mari JJ. Validity of a Brazilian version of the Older Americans Resources and Services (OARS) mental health screening questionnaire. *J Am Geriatr Soc*. 1988;36(8):687-92. doi: 10.1111/J.1532-5415.1988.TB07169.X.
15. Saelens BE, Sallis JF, Black JB, Chen D. Neighborhood-based differences in physical activity: an environment scale evaluation. *Am J Public Health*. 2003;93(9):1552-8. doi: 10.2105/AJPH.93.9.1552.
16. Malavasi LM, Duarte MFS, Both J, Reis RS. Escala de mobilidade ativa no ambiente comunitário - NEWS Brasil: retradução e reprodutibilidade. *Rev Bras Cineantropom Desempenho Hum*. 2007;9(4):339-50.
17. Florindo AA, Guimarães VV, Farias JC Jr, Salvador EP, Sá TH, Reis RS, et al. Validação de uma escala de percepção do ambiente para a prática de atividade física em adultos de uma região de baixo nível socioeconômico. *Rev Bras Cineantropom Desempenho Hum*. 2012;14(6):647-59. doi: 10.5007/1980-0037.2012V14N6P647.
18. Hagen M, Seidel S, Sanchez Bergmann D, Muehlbauer T. Associations between subtalar muscle strength and balance performance in healthy young and old adults. *Gerontology*. 2020;66(1):15-23. doi: 10.1159/000500972.
19. Granacher U, Muehlbauer T, Gruber M. A qualitative review of balance and strength performance in healthy older adults: impact for testing and training. *J Aging Res*. 2012;2012:708905. doi: 10.1155/2012/708905.
20. Kováčiková Z, Sarvestan J, Zemková E. Age-related differences in stair descent balance control: are women more prone to falls than men? *PLoS One*. 2021;16(1):e0244990. doi: 10.1371/journal.pone.0244990.
21. Liu JYW. The severity and associated factors of participation restriction among community-dwelling frail older people: an application of the International Classification of Functioning, Disability and Health (WHO-ICF). *BMC Geriatr*. 2017;17(1):43. doi: 10.1186/S12877-017-0422-7.
22. Gschwind YJ, Kressig RW, Lacroix A, Muehlbauer T, Pfenninger B, Granacher U. A best practice fall prevention exercise program to improve balance, strength / power, and psychosocial health in older adults: study protocol for a randomized controlled trial. *BMC Geriatr*. 2013;13:105. doi: 10.1186/1471-2318-13-105.
23. 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*. 2019;48(1):16-31. doi: 10.1093/ageing/afy169.
24. Soares MFN, Maia LC, Costa SM, Caldeira AP. Dependência funcional em idosos assistidos por equipes da Estratégia Saúde da Família. *Rev Bras Geriatr Gerontol*. 2019;22(5):e190147. doi: 10.1590/1981-22562019022.190147.
25. Schmidt TP, Wagner KJP, Schneider IJC, Danielewicz AL. Padrões de multimorbidade e incapacidade funcional em idosos brasileiros: estudo transversal com dados da Pesquisa Nacional de Saúde. *Cad Saude Publica*. 2020;36(11):1-12. doi: 10.1590/0102-311X00241619.
26. Goda A, Murata S, Nakano H, Matsuda H, Yokoe K, Mitsumoto H, et al. Temporal patterns in performance of the 30 s chair-stand test evince differences in physical and mental characteristics among community-dwelling older adults in Japan. *Healthcare (Basel)*. 2020;8(2):146. doi: 10.3390/healthcare8020146.
27. Cornelis E, Gorus E, Beyer I, Bautmans I, De Vriendt P. Early diagnosis of mild cognitive impairment and mild dementia through basic and instrumental activities of daily living: development of a new evaluation tool. *PLoS Med*. 2017;14(3):e1002250. doi: 10.1371/journal.pmed.1002250.
28. Koç Z, Sağlam Z. Determination of the effects of daily life activities and self-care capacity on depression of the elderly in northern Turkey. *Acta Clin Croat*. 2019;58(3):516-22. doi: 10.20471/acc.2019.58.03.16.
29. Tangen GG, Langballe EM, Strand BH. Subjective memory impairment, instrumental activities of daily living and longitudinal effect on mortality among older adults in a population-based cohort study: The HUNT Study. *Scand J Public Health*. 2020;48(8):825-31. doi: 10.1177/1403494819885234.
30. Ono LM, Confortin SC, Figueiró TH, Rech CR, D'Orsi E. Influence of instrumental activities of daily living on the cognitive impairment: EpiFloripa study. *Aging Ment Health*. 2020;24(3):382-6. doi: 10.1080/13607863.2018.1534079.
31. Smith AR, Chen C, Clarke P, Gallagher NA. Trajectories of outdoor mobility in vulnerable community-dwelling elderly: the role of individual and environmental factors. *J Aging Health*. 2016;28(5):796-811. doi: 10.1177/0898264315611665.
32. Rantakokko M, Törmäkangas T, Rantanen T, Haak M, Iwarsson S. Environmental barriers, person-environment fit and mortality among community-dwelling very old people. *BMC Public Health*. 2013;13:783. doi: 10.1186/1471-2458-13-783.
33. Mueller-Schotte S, Zuithoff NPA, Van der Schouw YT, Schuurmans MJ, Bleijenberg N. Trends in risk of limitations in instrumental activities of daily living over age in older persons with and without multiple chronic conditions. *J Gerontol A Biol Sci Med Sci*. 2020;75(1):197-203. doi: 10.1093/gerona/glz049.
34. Chaudhury H, Campo M, Michael Y, Mahmood A. Neighbourhood environment and physical activity in older adults. *Soc Sci Med*. 2016;149:104-13. doi: 10.1016/j.socscimed.2015.12.011.
35. Wong M, Yu R, Woo J. Effects of perceived neighbourhood environments on self-rated health among community-dwelling older chinese. *Int J Environ Res Public Health*. 2017;14(6):614. doi: 10.3390/ijerph14060614.



36. Cramm JM, Nieboer AP. Neighborhood attributes security and solidarity promote the well-being of community-dwelling older people in the Netherlands. *Geriatr Gerontol Int*. 2014;14(3):681-8. doi: 10.1111/ggi.12133.
37. Generaal E, Hoogendijk EO, Stam M, Henke CE, Rutters F, Oosterman M, et al. Neighbourhood characteristics and prevalence and severity of depression: pooled analysis of eight Dutch cohort studies. *Br J Psychiatry*. 2019;215(2):468-75. doi: 10.1192/bjp.2019.100.
38. Yen IH, Michael YL, Perdue L. Neighborhood environment in studies of health of older adults: a systematic review. *Am J Prev Med*. 2009;37(5):455-63. doi: 10.1016/j.amepre.2009.06.022.
39. Roux AVD, Mair C. Neighborhoods and health. *Ann N Y Acad Sci*. 2010;1186(1):125-45. doi: 10.1111/j.1749-6632.2009.05333.x.