



REVISTA DE LA FACULTAD DE CIENCIAS DE LA SALUD

Vol. 28(1):96-107, April - July 2025
i-ISSN 0123-7047 e-ISSN 2382-4603



Original article

Level of functional independence and personal and social determinants of healthy aging in Peruvian older adults during COVID-19

Nivel de independencia funcional, determinantes personales y sociales del envejecimiento saludable en adultos mayores peruanos durante la COVID-19

Nível de independência funcional, determinantes pessoais e sociais do envelhecimento saudável em idosos peruanos durante a COVID-19

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ARTICLE INFORMATION:

Article received: July 19, 2024

Article accepted: July 31, 2025

DOI: <https://doi.org/10.29375/01237047.5102>

How to cite. Enriquez-Canto Y, Pizarro-Andrade RDN. Level of functional independence and personal and social determinants of healthy aging in Peruvian older adults during COVID-19. MedUNAB [Internet]. 2025;28(1):96-107. doi: <https://doi.org/10.29375/01237047.5102>

ABSTRACT

Introduction. The population of older adults reached 900 million in 2010 and is projected to double by 2050. For this reason, it is crucial to understand the factors that affect this population's autonomy. This study sought to identify individual, social, and behavioral determinants of functional independence and to examine whether depressive symptomatology and social relationships moderate the association between age and functionality in older adults during COVID-19. **Methodology.** A cross-sectional study with secondary analysis of the public data of 244 older adults, 60 years of age, with socioeconomic vulnerability, from two peripheral urban areas. The Barthel index was used to assess functional independence and moderation analyses and ordinal logistic regression models were applied. **Results.**



VIGILADA MINEDUCACIÓN

Author Contributions

YEC.

Conceptualization, methodology, software, data curation, original draft preparation, writing and editing and supervision.

RPA. Methodology, data curation, writing and reviewing.

Sixty-nine percent of subjects demonstrated functional independence. Depressive symptomatology ($-0.06 [-0.12; -0.01]$, $p=0.014$) and quality of relationships with neighbors ($0.454 [0.17; 0.73]$, $p=0.001$) moderated the relationship between age and functional independence. Widowers were 70% less likely to be independent than married people ($p=0.005$). Those who never received calls before the pandemic were 74% less likely to be independent ($p=0.006$). Participants in mental health talks presented 4.9 times higher odds of independence compared to non-participants ($p<0.001$). **Discussion.** Functional independence in aging is not only age-dependent; it is also influenced by individual and social factors, including depressive symptomatology and social interaction. **Conclusions.** It is essential to comprehensively address healthy aging, considering the psychosocial needs of older adults.

Keywords:

Aging; Functional Status; Aged; COVID-19; Social Interaction; Social Support; Peru

RESUMEN

Introducción. La población de adultos mayores alcanzó los 900 millones en el 2010 con proyección a duplicarse para el 2050 por lo que es crucial entender los factores que afectan la autonomía de esta población. El estudio buscó identificar los determinantes individuales, sociales y conductuales de la independencia funcional y examinar si la sintomatología depresiva y las relaciones sociales moderan la

asociación entre la edad y la funcionalidad en adultos mayores durante la COVID-19. **Metodología.** Estudio de corte transversal con análisis secundario de datos públicos de 244 adultos mayores, de 60 años, con vulnerabilidad socioeconómica, de dos áreas urbanas periféricas. Se utilizó el índice de Barthel para evaluar la independencia funcional y se aplicaron análisis de moderación y modelos de regresión logística ordinal. **Resultados.** El 69% presentó independencia funcional. La sintomatología depresiva ($-0.06 [-0.12; -0.01]$, $p=0.014$) y la calidad de la relación con los vecinos ($0.454 [0.17; 0.73]$, $p=0.001$) moderaron la relación entre la edad y la independencia funcional. Los viudos tuvieron 70% menos de probabilidades de independencia que los casados ($p=0.005$). Quienes nunca recibían llamadas antes de la pandemia tenían 74% menos de probabilidades de independencia ($p=0.006$). Los participantes en charlas de salud mental presentaron 4.9 veces más probabilidades de independencia en comparación con los no participantes ($p<0.001$). **Discusión.** La independencia funcional en el envejecimiento no solo depende de la edad, está también influenciada por factores individuales y sociales, incluyendo la sintomatología depresiva y la interacción social. **Conclusiones.** Es fundamental abordar el envejecimiento saludable integralmente, considerando las necesidades psicosociales de los adultos mayores.

Palabras clave:

Envejecimiento; Estado Funcional; Anciano; COVID-19; Interacción Social; Apoyo Social; Perú

RESUMO

Introdução. A população idosa atingiu 900 milhões em 2010, com projeção de duplicar até 2050, tornando crucial compreender os fatores que afetam a autonomia desse grupo. O estudo buscou identificar os determinantes individuais, sociais e comportamentais da independência funcional e examinar se a sintomatologia depressiva e as relações sociais moderam a associação entre idade e funcionalidade em idosos durante a COVID-19. **Metodologia.** Foi realizado um estudo transversal com análise secundária de dados públicos de 244 idosos, de 60 anos, em situação de vulnerabilidade socioeconômica, de duas áreas urbanas periféricas. Foi utilizado o índice de Barthel para avaliar a independência funcional e foram aplicadas análises de moderação e modelos de regressão logística ordinal. **Resultados.** Do total, 69% apresentaram independência funcional. A sintomatologia depressiva ($-0.06 [-0.12; -0.01]$, $p=0.014$) e a qualidade dos relacionamentos com os vizinhos ($0.454 [0.17; 0.73]$, $p=0.001$) moderaram a relação entre idade e independência funcional. Indivíduos viúvos tiveram 70% menos chances de independência em comparação aos indivíduos casados ($p=0.005$). Aqueles que nunca receberam ligações antes da pandemia tiveram 74% menos chances de independência ($p=0.006$). Participantes de conversatórios sobre saúde mental tiveram 4,9 vezes mais chances de independência em comparação aos não participantes ($p<0.001$). **Discussão.** A independência funcional no envelhecimento não depende apenas da idade, mas também é influenciada por fatores individuais e sociais, incluindo a sintomatologia depressiva e a interação social. **Conclusões.** É essencial abordar o envelhecimento saudável de forma integral, considerando as necessidades psicossociais dos idosos.

Palavras-chave:

Envelhecimento; Estado Funcional; Idoso; COVID-19; Interação Social; Apoio Social; Peru

Introduction

In a global context where the older adult population is steadily growing (having reached 900 million in 2019 and projected to double by 2050), it is fundamental to understand the factors influencing their well-being and autonomy (1). According to the National Institute of Statistics and Informatics, the proportion of older adults in Peru increased from 5.7% in 1950 to 13.9% in 2024, reflecting a global aging trend (2). This growth poses significant challenges for public health and social care systems, especially in the context of health crises such as the COVID-19 pandemic (3–6). In Latin America, the SARS-CoV-2 pandemic has presented specific challenges for the health and well-being of older adults, potentially impacting their functional independence (7–9).

COVID-19 represented an unprecedented threat to this age group, which was more vulnerable due to the high prevalence of comorbidities and immune system deterioration associated with aging (8,10). Chronic diseases such as hypertension, diabetes, cardiovascular disease, and chronic obstructive pulmonary disease (COPD) significantly increased the risk of severe complications from SARS-CoV-2 infection, resulting in higher hospitalization and mortality rates (11,12).

The World Health Organization (WHO) approach to healthy aging focuses on functional and intrinsic capacity, promoting optimal aging through the integration of social, economic, and health factors (13,14). Functional capacity is defined as the combination of all bodily functions that allow a person to be and do what they value, participating in social, economic, and cultural life (15). A key component of this capacity is functional independence, which can be assessed through basic activities of daily living such as eating, dressing, and walking (11,16). This concept is essential for understanding autonomy and well-being in old age (15). Social determinants of healthy aging include factors such as the physical environment, support networks, and access to health services, which are essential for maintaining an active life and social participation (13,14).

Worldwide, various systematic reviews and meta-analyses have documented the determinants of functional independence in older adults, establishing a robust conceptual framework for the interaction between personal and social factors (17–19). Accumulated evidence highlights the importance of factors such as physical health, social support, and living conditions in maintaining functionality. The specialized literature demonstrates the complex interaction between personal determinants (physical and mental health, lifestyle)

and social determinants (social support, community networks) in preserving functional independence (20–23). Social support has been shown to be a significant predictor of functionality in older adults (24,25), while adverse conditions such as poverty and lack of access to health services exacerbate the loss of functional autonomy (26,27).

In addition, the literature suggests that the age-functionality relationship may vary depending on psychosocial factors, and it is crucial to examine how these factors modify this relationship (24,25). However, most of these studies have been conducted in high-income countries with robust health systems and consolidated social protection networks (22–25). Findings from developed countries may not be directly applicable to contexts in middle-income countries such as Peru, where marked socioeconomic inequalities coexist with limited access to health services and fragmented social protection systems (7,10). Furthermore, previous studies have limitations—they focus on a single determinant (28) or use convenience samples (29); few have examined moderation effects between psychosocial variables and age, and none have specifically evaluated socioeconomically vulnerable populations during health crises (24,30,31).

Moreover, research addressing these aspects in the Peruvian context is scarce (28,29). This gap is particularly relevant considering that Peru exhibits unique socioeconomic characteristics: 70% of older adults lack a contributory pension, 40% live in poverty or extreme poverty, and there is marked geographic and cultural heterogeneity affecting determinants of healthy aging (2). The Peruvian health system also had specific limitations during the pandemic that may have differentially affected this population, being almost unprotected during the global health crisis (32).

It is crucial to examine how these variables are articulated in a scenario affected by COVID-19, a situation that has exposed and, in many cases, exacerbated the vulnerabilities of this population and reduced opportunities for healthy aging (3,33,34). There is thus a clear gap in existing knowledge. This knowledge is relevant for formulating effective public policies that address the specific needs of this population. Additionally, the results have the potential to influence care practices that promote healthy aging, not only in crisis contexts. Consequently, the aim was to identify individual, social, and behavioral determinants of functional independence and to examine whether depressive symptomatology and social relationships moderate the association between age and functionality in socioeconomically vulnerable older adults during COVID-19.

Methodology

Design and Population

An observational cross-sectional study was carried out through secondary analysis of data collected from a public and anonymized database (35). The database originates from an original study enrolling older adults assisted by the social program Community Development Promotion Liberation (COPRODELI) in urban peripheral areas of the Ica and Callao regions in Peru (32).

COPRODELI is a nonprofit organization providing primary care and social support services to socioeconomically vulnerable older adults residing in urban-marginal communities in these coastal regions. Participants are beneficiaries of comprehensive care programs that include preventive health services, recreational activities, and psychosocial support, mostly consisting of older adults living in limited socioeconomic conditions and depending on these social programs for access to basic health and well-being services.

The original database was constructed considering that, from the total eligible population (263) in COPRODELI sites, 259 participants were contacted, with four lost during recruitment. Non-probability convenience sampling was used, justified by its accessibility, feasibility, and the need to specifically analyze socioeconomically vulnerable older adults. Inclusion criteria were community-dwelling adults aged 60 and older with normal cognitive capacity (score above 23 on the Mini-Mental State Examination, MEC-30); fifteen participants with cognitive impairment or psychiatric/neurological illnesses were excluded. The final analytical sample consisted of 244 older adults.

Variables and Instruments

Information was collected between December 2020 and January 2021, coinciding with the second wave of the COVID-19 pandemic in the country. Functional independence was assessed using the Barthel Index ($\alpha = 0.94$), which measures the ability to perform daily activities such as feeding and personal hygiene. Categories of functional independence were considered according to standard cut-off points: independence (91–100 points), mild dependence (61–90 points), moderate dependence (41–60 points), and severe dependence (0–40 points). Depressive symptomatology was assessed using the 15-item Yesavage Geriatric Depression Scale ($\alpha = 0.83$ – 0.92 , sensitivity = 84–90%), with the following cutoffs: normal (0–5), mild depressive symptoms (6–10), and severe depressive symptoms (11–15).

Data were collected through a structured questionnaire including individual variables (sex, age, depressive

symptomatology), behavioral variables (frequency of tobacco and alcohol consumption), and social variables. Social variables included structural aspects (marital status, residence area, family type, and education level) and social support, covering both formal (type of institutional support received [COPRODELI only or COPRODELI plus another institution], receipt of mental health talks) and informal support (frequency of visits and calls, quality of relationship with neighbors or acquaintances [measured on a Likert scale from 'none' to 'very good'], impact of COVID-19). Information on medical diagnoses was also collected. All variables were categorized based on determinants influencing healthy aging from the WHO perspective (14,36). This set of variables allowed for the evaluation of both the basic daily functioning of the person and the contextual factors influencing it.

Jamovi software version 2.3.18 was used for descriptive analysis and to explore associations between variables using chi-square tests, analysis of variance (ANOVA), and Kruskal–Wallis. Moderation analysis was conducted using multiple linear regression models, evaluating interactions between age and functional independence with individual and social determinants. Multicollinearity was controlled for, and ordinal logistic regression analyses were performed, given the ordinal nature of the functional independence variable, to estimate odds ratios (OR) and their 95% confidence intervals.

Two regression models were constructed to evaluate the probability of functional independence, considering individual determinants and their interaction with social determinants. Model fit criteria such as Akaike information criterion (AIC), chi-square test, and omnibus likelihood ratio test were used to assess overall significance, with a significance level of $p < 0.05$.

Secondary data analysis was approved by the Institutional Ethics Committee of Universidad Católica Sedes Sapientiae (CE-1676).

Results

Table 1 describes the characteristics of 244 older adults participating in a social program. Significant differences between genders were observed in age ($p < 0.001$), marital status ($p = 0.009$), and family type ($p = 0.008$). Women had a lower mean age, a higher percentage of married individuals and extended families, while men had a higher proportion of divorced individuals or lived alone. Regarding the impact of COVID-19, a significantly higher percentage of women reported having a close relative who died from the disease (67.2%). In terms of functional independence, women showed a higher percentage (63.9%) of independence, while men had a higher percentage of severe dependence (75%).

Table 1. Sociodemographic Characteristics and Their Association with Sex in Peruvian Older Adults in a Social Program (n=244).

	Female n=151	Male n=93	p-value
	n (%)	n (%)	
Age (Mean/SD)	71.87 (5.31)	74.96 (6.64)	<0.001
Marital Status			0.009
Married	57 (64.0)	32 (36.0)	
Widowed	41 (75.9)	13 (24.1)	
Single	49 (55.7)	39 (44.3)	
Divorced	4 (30.8)	9 (69.2)	
Family Type			0.008
Lives alone	50 (52.6)	45 (47.4)	
Nuclear family	55 (63.2)	32 (36.8)	
Extended family	45 (77.6)	13 (22.4)	
Education level			0.407
None	6 (85.7)	1 (14.3)	
Primary/Secondary	136 (61.0)	87 (39.0)	
Technical/University	9 (64.3)	5 (35.7)	
Place of Residence			0.234
Callao	96 (64.9)	52 (35.1)	
Ica	55 (57.3)	41 (42.7)	
Area of Residence			0.403
Urban	83 (64.3)	46 (35.7)	
Rural	68 (59.1)	47 (40.9)	
Frequency of Visits Before COVID			0.598
Never	18 (52.9)	16 (47.1)	
Almost never	30 (58.8)	21 (41.2)	
Sometimes	65 (66.3)	33 (33.7)	
Almost Always	21 (58.3)	15 (41.7)	
Always	17 (68.0)	8 (32.0)	
Frequency of Calls Before COVID-19			0.285
Never	42 (68.9)	19 (31.1)	
Almost never	55 (61.8)	34 (38.2)	
Sometimes	35 (52.2)	32 (47.8)	
Almost Always	14 (73.7)	5 (26.3)	
Always	5 (62.5)	3 (37.5)	
Frequency of Calls During COVID-19			0.302
Never	17(50.0)	17 (50.0)	
Almost never	22 (71.0)	9 (29.0)	
Sometimes	49 (57.6)	36 (42.4)	
Almost Always	40 (67.8)	19 (32.2)	
Always	23 (65.7)	12 (34.3)	
Close Relative Died from COVID-19			0.336
No	112 (60.2)	74 (39.8)	
Yes	39 (67.2)	19 (32.8)	

How Often Do You Smoke?			0.055
Never	149 (63.1)	87 (36.9)	
Almost never	1 (16.7)	5 (83.3)	
Sometimes	0 (0.0)	1 (100)	
Almost Always	1 (100)	0 (0.0)	
How Often Do You Drink Alcoholic Beverages?			0.010
Never	141 (65.0)	76 (35.0)	
Almost never	9 (42.9)	12 (57.1)	
Sometimes	1 (16.7)	5 (83.3)	
Quality of Relationship with Neighbors or Acquaintances			0.104
None	4 (66.7)	2 (33.3)	
Very Poor	2 (100)	0 (0.0)	
Poor	5 (100)	0 (0.0)	
Good	68 (55.3)	55 (44.7)	
Very Good	72 (66.7)	36 (33.3)	
Receives Support from a Social Program			0.761
COPRODELI	116 (61.4)	73 (38.6)	
COPRODELI & another institution	35 (63.6)	20 (36.4)	
Any Medical Diagnosis?			0.439
No	59 (59.0)	41 (41.0)	
Yes	92 (63.9)	52 (36.1)	
Received Mental Health Support Talks			0.514
No	113 (60.8)	73 (39.2)	
Yes	38 (65.5)	20 (34.5)	
Functional Independence Level (Mean/SD)	96.79 (7.40)	94.89 (11.75)	0.308*
Severe	1 (25.0)	3 (75.0)	0.401
Moderate	22 (61.1)	14 (38.9)	
Mild	20 (57.1)	15 (42.1)	
Independent	108 (63.9)	61 (36.1)	
Depressive Symptomatology (Mean/SD)	5.03 (3.07)	4.96 (3.18)	0.908*
Normal	93 (62.4)	56 (37.6)	0.848
Mild	41 (59.4)	28 (40.6)	
Severe	17 (65.4)	9 (34.6)	

Note: * Mann-Whitney U test

Source: prepared by authors

Table 2 shows that depressive symptomatology had a moderating effect between age and functional independence (-0.0642 , $p=0.014$). Figure 1a illustrates this effect, showing a negative slope (-0.3536 , $p=0.002$) for age in functional dependence at high levels of depression ($+1SD$). Furthermore, the relationship with neighbors also

moderates the correlation between age and functional independence (0.454 , $p=0.001$). Figure 1b shows a negative slope (-0.612 , $p<0.001$) for age in functional independence among those with low neighbor relationship quality ($-1SD$).

Table 2. Moderation Analysis of the Correlation between Age and Functional Independence in Peruvian Older Adults in a Social Program.

Moderator	Interaction Slope Coefficients*					
	Moderator (95% IC); p	Age (95% IC); p	interaction (95% IC); p	Average (95% IC); p	Low (-1DE) (95% IC); p	High (+1DE) (95% IC); p
Depression	-0.70 (-1.05- -0.34); >0.001	-0.15 (-0.34-0.03); 0.109	-0.06 (-0.12- -0.01); 0.014	-0.15 (-0.34-0.03); 0.112	0.04 (-0.23 - 0.32); 0.748	-0.35 (-0.57 - -0.13); 0.002
Relationship with Neighbors or Acquaintances	1.47 (0.04-2.91); 0.044	-0.23 (-0.44- -0.07); 0.006	0.45 (0.17-0.73); 0.001	-0.26 (-0.45- -2.65); 0.008	-0.61 (-0.31- -4.07); >0.001	0.09 (-0.19-0.38); 0.514

* Shows the effect of age on functional independence at different levels of the moderator.

Source: prepared by authors

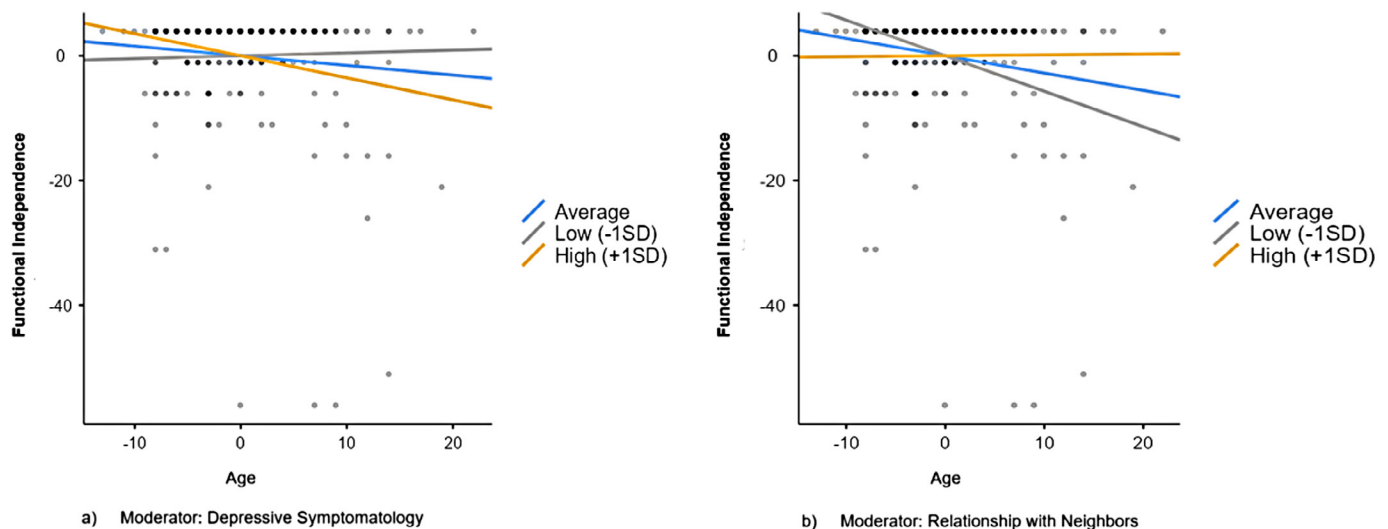


Figure 1: Moderating Effect of Depressive Symptomatology and Relationship with Neighbors on the Relationship between Functional Independence and Age. The graph shows the relationship between age and functional independence in older adults in two contexts: depressive symptoms (panel a) and neighbor relations (panel b). Each panel presents three lines representing average functional independence, one standard deviation below the average (low), and one standard deviation above the average (high). The graph illustrates how functional independence changes in relation to age, depending on the level of depression and neighbor relations.

Source: prepared by authors

Results of the ordinal logistic regression analysis are presented in Table 3. Model 1 considered individual determinants, while Model 2 included social determinants. In Model 1, marital status was associated with functional independence; widowed ($OR = 0.343$, $p=0.006$) and single individuals ($OR = 0.427$, $p=0.012$) had, respectively, 66%

and 57% lower odds of being independent compared to married individuals. Older adults with severe depressive symptoms had 74% lower odds of being independent compared to those with normal symptomatology ($OR = 0.260$, $p = 0.002$).

Table 3. Ordinal Logistic Regression of Factors Associated with Functional Independence among Peruvian Older Adults in a Social Program.

Marital Status	Model 1			Model 2		
	ORa	95% IC	p	ORa	95% IC	p
Married	Ref.			Ref.		
Widowed	0.343	0.158-0.736	0.006	0.307	0.132-0.702	0.005
Single	0.427	0.216-0.822	0.012	0.424	0.202-0.866	0.020
Divorced	1.209	0.290-8.282	0.816	1.089	0.223-8.085	0.992
Depressive Symptomatology						
Normal	Ref.			Ref.		
Mild	0.588	0.317-1.103	0.095	0.601	0.303-1.200	0.146
Severe	0.260	0.111-0.617	0.002	0.265	0.099-0.708	0.008
Frequency of Visits Before COVID						
Never				Ref.		
Almost never				0.629	0.197-1.920	0.421
Sometimes				1.367	0.432-4.105	0.583
Almost Always				2.572	0.574-12.140	0.220
Always				2.295	0.453-12.727	0.322
Frequency of Calls Before COVID-19						
Never				Ref.		
Almost never				0.262	0.097-0.654	0.006
Sometimes				0.221	0.072-0.630	0.006
Almost Always				0.804	0.158-5.069	0.801
Always				0.213	0.031-1.936	0.130
Frequency of Calls During COVID-19						
Never				Ref.		
Almost never				0.716	0.219-2.299	0.575
Sometimes				0.661	0.231-1.813	0.427
Almost Always				1.312	0.382-4.480	0.663
Always				1.494	0.369-6.403	0.578
Receives Support from a Social Program						
COPRODELI				Ref.		
COPRODELI & another institution				0.845	0.412-1.754	0.647
Received Mental Health Support Talks						
No				Ref.		
Yes				4.931	2.131-12.713	<.001
R2	0.056			0.177		

Model 1 adjusted for marital status and depressive symptoms. Model 2 adjusted for marital status, depressive symptoms, frequency of visits from family or friends before the pandemic, frequency of calls before the pandemic, frequency of calls during the pandemic, support from social programs, and having received talks as support for mental health. ORa: adjusted odds ratio. 95% CI: 95% confidence interval. Ref.: reference category. R2: Nagelkerke Pseudo R2.

Source: prepared by authors

Comparison test ($\chi^2 = 43.9$, $p < 0.001$) indicated that Model 2 had a better fit than Model 1. Marital status remained statistically significant; widowed ($OR = 0.307$, $p = 0.005$) and single older adults ($OR = 0.424$, $p = 0.020$) had, respectively, 70% and 58% lower odds of being independent compared to their married counterparts.

The frequency of receiving calls before the COVID-19 pandemic was also associated with functional independence. Older adults who almost never ($OR = 0.262$, $p = 0.006$) or occasionally ($OR = 0.221$, $p = 0.006$) received calls had 74% and 78% lower odds of being independent, respectively, compared to those who never received them. In contrast, older adults who participated in mental health support talks had 4.93 times higher odds of being independent compared to those who did not participate ($OR = 4.931$, $p < 0.001$).

Discussion

This study, based on the WHO's determinants of healthy aging (9,27), analyzed functional independence in daily living activities among Peruvian older adults during COVID-19, considering individual, social, and behavioral factors. The results reveal that functional independence depends not only on age but also is modulated by a set of factors. Moderation analysis indicated that depressive symptomatology and the quality of relationships with neighbors influence the relationship between age and functional independence. Ordinal regression analysis revealed that marital status and social interaction, especially the frequency of phone calls and participation in mental health talks, are key factors associated with functional independence.

Moderation analysis revealed that depressive symptomatology, as an individual determinant, significantly influences the relationship between age and functional independence. Individuals with high depressive symptomatology experienced a more pronounced negative impact of age on their functional independence. These findings are consistent with Latin American studies that have shown depressive symptomatology to be an important predictor of functional disability in older adults (20,21). Studies in the United States and Germany also report that depressive symptoms are associated with significant loss of physical function in older adults (22,23). Our results suggest that depressive symptomatology not only affects functional independence directly but also amplifies the negative impact of age on functionality.

Regarding marital status, widowed and single older adults had a lower probability of being independent compared to married individuals. The mental and physical health risks associated with loneliness and social isolation in old age are well documented (4,37). In this sense, marital

status may play a role similar to social interaction in the independence of older adults, reinforcing the hypothesis that the support and companionship provided by marital relationships are crucial for preserving functional independence (24,25). Married older adults benefit from greater support in daily activities as well as social and emotional support from their spouses, which benefits their functional autonomy (38).

Furthermore, the second regression model revealed that among the social determinants, the frequency of phone calls before the COVID-19 pandemic, was associated with independence in daily living activities. Previous research highlights the importance of social interaction for the mental and physical health of older adults (24,25). Social interaction can serve as a buffer against disease onset, as it improves cognitive capacity, coping skills, and overall quality of life, translating into greater autonomy (4,22,38). As a result, older adults may enjoy greater mobility and independence (30).

Findings also indicate that among the social determinants of healthy aging, participation in mental health talks is associated with functional independence. These results are consistent with previous literature showing that social support is fundamental for maintaining functional independence in older adults (31). Additionally, participation in mental health talks may provide older adults with effective strategies to manage stress and negative emotions, which, in turn, may contribute to greater autonomy in daily activities (39,40). This may be because these talks provide a space for social interaction, education on mental health, and access to support resources, facilitating the maintenance of functional independence and resilience during crises (30,31).

Interestingly, in the context of this study, no significant association was found between behavioral determinants and functional independence in daily activities, nor between variables directly related to the pandemic and functionality. These findings suggest that, in this context, other factors, such as mental health and social interaction, may have greater weight in determining the functional independence of older Peruvian adults.

When interpreting these results, it is important to consider limitations and potential biases. The non-probabilistic sample and specific context limit the generalizability of findings to the general older adult population in Peru, potentially introducing selection bias. The absence of information on variables such as self-care, physical activity, and access to health services limits a comprehensive understanding of the determinants of functional independence. Additionally, cross-sectional design does not allow for determination of the directionality of the associations, and a temporal

bias inherent to such designs may exist. As a secondary data analysis, there is the possibility of information bias, as the variables were originally collected for other research purposes. Despite this, the study is strengthened using moderation analysis and ordinal logistic regression, which allow for the evaluation of the influence of multiple factors on functional independence. Conducted during the pandemic, this study provides valuable information on the behavior of the variables of interest during a health emergency.

Conclusions

This study, conducted in socioeconomically vulnerable Peruvian older adults during the COVID-19 pandemic, reveals that functional independence depends not only on age but also on psychosocial factors. Depressive symptomatology negatively impacts functional independence, while a strong social network, certain marital statuses, and social interaction (phone calls, participation in mental health talks) are favorably associated with its maintenance.

These findings suggest that comprehensive geriatric assessment should systematically incorporate the evaluation of social networks, considering their quality and support capacity. Primary care teams can use social network assessment as a screening tool to identify at-risk older adults and develop care plans that include specific social interventions.

It is necessary to create multidimensional strategies that integrate the strengthening of social support to maintain functional independence, particularly relevant in post-pandemic contexts where social networks have been significantly affected.

Conflict of interest

The authors declare that they have no conflicts of interest.

Funding

No external funding was provided to the authors for this study.

Ethical considerations

Protection of Persons: This study is a secondary analysis derived from a publicly accessible database (<https://zenodo.org/records/5498990>). It is considered risk-free research due to its observational nature. The research was approved by the Bioethics Committee of Universidad Católica Sedes Sapientiae.

Data Confidentiality: The information is anonymized, and it is not possible to identify participants.

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