

Depression and Functional Disability Among Older Adults in Brazil: Analysis of the 2019 National Health Survey

Depressão e Incapacidade Funcional em Idosos Brasileiros: Análise da Pesquisa Nacional de Saúde 2019

Depresión e Incapacidad Funcional en Adultos Mayores Brasileños: Análisis de la Encuesta Nacional de Salud 2019

RESUMO

Objetivo: Analisar a associação entre depressão e incapacidade funcional em idosos brasileiros. **Métodos:** Estudo transversal com dados da Pesquisa Nacional de Saúde 2019. Incluídos 22.357 indivíduos com ≥ 60 anos. A variável dependente foi o diagnóstico autorreferido de depressão. As independentes abrangeram características sociodemográficas, comportamentos de saúde, autoavaliação de saúde e incapacidade funcional (AVD e AIVD). Usou-se regressão de Poisson com variância robusta, estratificada por sexo. **Resultados:** A prevalência de depressão foi maior em mulheres (15,8%) que em homens (6,6%). Após ajuste, a autoavaliação negativa de saúde associou-se à maior prevalência de depressão em ambos os sexos, com maior magnitude em homens (RP=3,11; IC95%:2,29-4,21) que em mulheres (RP=1,68; IC95%:1,41-1,99). Limitação em AIVD associou-se à depressão em ambos, mais pronunciada em homens (RP=2,32; IC95%:1,69-3,19) que em mulheres (RP=1,35; IC95%:1,15-1,59). Limitação em AVD manteve associação apenas em homens (RP=1,67; IC95%:1,19-2,34). **Conclusão:** A depressão em idosos brasileiros está associada à incapacidade funcional e pior percepção de saúde, com diferenças entre sexos. Reforça-se a necessidade de cuidado em saúde mental atento à funcionalidade e gênero no envelhecimento.

DESCRIPTORES: Depressão; Incapacidade Funcional; Idoso; Inquéritos de Saúde.

ABSTRACT

Objective: To analyze the association between depression and functional disability among older adults in Brazil. **Methods:** Cross-sectional study using 2019 National Health Survey data. Included 22,357 individuals aged ≥ 60 years. Outcome: self-reported depression diagnosis. Independent variables: sociodemographic, health behaviors, self-rated health, and functional disability (BADL/IADL). Poisson regression with robust variance, stratified by sex. **Results:** Depression prevalence higher in women (15.8%) than men (6.6%). After adjustment, poor self-rated health was strongly associated with depression in both sexes, greater in men (PR=3.11; 95%CI:2.29-4.21) than women (PR=1.68; 95%CI:1.41-1.99). IADL limitations were associated in both sexes, stronger in men (PR=2.32; 95%CI:1.69-3.19) vs women (PR=1.35; 95%CI:1.15-1.59). BADL limitations associated only in men (PR=1.67; 95%CI:1.19-2.34). **Conclusion:** Depression is associated with functional disability and poor self-rated health, with sex differences. Findings highlight need for mental health strategies integrating functionality and gender in aging.

DESCRIPTORS: Depression; Disability; Older Adults; Health Surveys.

RESUMEN

Objetivo: Analizar la asociación entre depresión e incapacidad funcional en adultos mayores brasileños. **Métodos:** Estudio transversal con datos de la Encuesta Nacional de Salud 2019. Se incluyeron 22.357 individuos con ≥ 60 años. Variable dependiente: diagnóstico autorreferido de depresión. Independientes: sociodemográficas, comportamientos, autoevaluación de salud e incapacidad funcional (ABVD/AIVD). Se usó regresión de Poisson con varianza robusta estratificada por sexo. **Resultados:** Prevalencia de depresión mayor en mujeres (15,8%) que en hombres (6,6%). Tras ajuste, la autoevaluación negativa se asoció a depresión en ambos sexos, mayor en hombres (RP=3,11; IC95%:2,29-4,21) que en mujeres (RP=1,68; IC95%:1,41-1,99). Limitación en AIVD asociada en ambos, más pronunciada en hombres (RP=2,32; IC95%:1,69-3,19) que en mujeres (RP=1,35; IC95%:1,15-

1,59). Limitación en ABVD mantuvo asociación solo en hombres (RP=1,67; IC95%:1,19-2,34). **Conclusión:** La depresión en adultos mayores se asocia a incapacidad funcional y peor percepción de salud, con diferencias por sexo. Se refuerza la necesidad de cuidado en salud mental que considere funcionalidad y género en el envejecimiento.

DESCRIPTORES: Depresión; Incapacidad Funcional; Adulto Mayor; Encuestas de Salud.

RECEIVED: 07/01/2026 **APPROVED:** 08/07/2026

How to cite this article: Tomé LM, Marques DMS, Oliveira NF, Silva NAP, Massa KHC. Depression and Functional Disability Among Older Adults in Brazil: Analysis of the 2019 National Health Survey. *Saúde Coletiva (Brazilian Edition)* [Internet]. 2026 [cited year month day];18 (112):20784-20805. Available from: DOI: 10.36489/saudecoletiva.2026v18i112p20784-20805

ID Letycia Manta Tomé
Undergraduate student. Anhembi Morumbi University.
ORCID: <https://orcid.org/0009-0005-6932-9829>.

ID Dayanne Mykaelly de Sousa Marques
Undergraduate student. Anhembi Morumbi University.
ORCID: <https://orcid.org/0009-0006-3831-2896>.

ID Nathalia Faquinelli de Oliveira
Undergraduate student. Anhembi Morumbi University.
ORCID: <https://orcid.org/0000-0003-4491-8721>.

ID Natércia de Ávila Pessoa Silva
Undergraduate student. Anhembi Morumbi University.
ORCID: <https://orcid.org/0009-0002-0476-9709>.

ID Kaio Henrique Correa Massa
Ph.D. Anhembi Morumbi University.
ORCID: <https://orcid.org/0000-0001-9954-2659>.

INTRODUCTION

Depression is one of the most prevalent mental disorders worldwide, characterized by persistent depressed mood, loss of interest or pleasure in usual activities, and cognitive and somatic symptoms that impair daily functioning.¹ Among older adults, depression is of particular concern due to its high prevalence and its impact on functional status, quality of life, and mortality.² In Brazil, estimates indicate that approximately 11.8% of individuals aged 60 or older report a diagnosis of depression, with this condition being more common among women, older adults, and those with lower levels of education.³

Brazil is undergoing a rapid process of population aging, characterized by a progressive increase in the proportion of people aged 60 or older within the population's age structure.⁴ This demographic phenomenon is associated with a higher prevalence of chronic

diseases and other health conditions, including mental disorders, which now account for a significant portion of the disease burden in this age group.^{5,6} In this context, depression stands out as a major public health problem, requiring strategies for early detection, appropriate clinical management, and care interventions aimed at preserving the quality of life and autonomy of older adults.⁷

The aging process is also associated with an increased incidence of chronic noncommunicable diseases, such as hypertension, diabetes mellitus, and osteoarthritis—conditions that frequently compromise the physical functioning, independence, and autonomy of older adults.⁸ The presence of multimorbidity can exacerbate psychosocial and emotional vulnerabilities, contributing to greater vulnerability to the development of mental disorders.⁹ In this context, mechanisms such as social isolation, functional limitations, chronic stress, and inflammatory pro-

cesses have been identified as potential mediators in the relationship between multimorbidity and depression in the elderly population.¹⁰

Functional disability refers to limitations in performing activities of daily living, including both basic and instrumental activities, which can compromise autonomy and social participation.¹¹ Evidence suggests that the relationship between depression and functional disability is potentially bidirectional: while depressive symptoms can reduce motivation, energy, and engagement in daily activities, functional limitations can increase dependence, social isolation, and psychological distress.¹²⁻¹³

Gender-related differences have been consistently observed in the occurrence and determinants of depression across the life course. Epidemiological studies indicate that women have a significantly higher prevalence of depression compared to men, a phenomenon attributed to the interaction

between biological, psychosocial, and contextual factors.¹⁴ Population-based systematic reviews indicate that the prevalence of depression may be up to twice as high among women.¹⁵ Among older adults, in addition to these differences in prevalence, factors associated with functionality, autonomy, and social participation may play distinct roles in the manifestation and progression of depressive symptoms among men and women.¹⁶ In Brazil, studies have also highlighted gender inequalities in the occurrence of mental disorders, reinforcing the importance of considering sex as a relevant analytical dimension in epidemiological investigations of depression.¹⁷

In the Brazilian context, studies such as the FIBRA-RJ Study suggest that psychosocial factors, such as the expectation of informal social support, may mitigate depressive symptoms among older adults with functional limitations.¹⁸ However, evidence from national studies with representative samples investigating this association in the Brazilian older adult population remains scarce. Accordingly, the present study aimed to analyze the association between depression and functional disability among Brazilian older adults.

METHODS

Data Source and Study Design

This is a cross-sectional study that used secondary data from the 2019 National Health Survey (PNS), a population-based household survey conducted by the Brazilian Institute of Geography and Statistics (IBGE). The PNS employs a complex, three-stage, cluster-based probabilistic sampling design: census tracts (primary units), households (secondary units), and randomly selected adult individuals (tertiary units). In 2019, the PNS covered 108,482 individuals residing in approximately 81,000 households distributed across regions, federal units, and state

capitals, representing the non-institutionalized Brazilian population.

Among the 23,728 older adults interviewed in the 2019 PNS, 1,371 individuals with incomplete data were excluded, resulting in a final analytical sample of 22,357 participants.

Variables

The dependent variable was the self-reported medical diagnosis of depression, obtained from the question: "Has a doctor or mental health professional ever diagnosed you with depression?"

The independent variables included sociodemographic and health characteristics, as well as information related to functional capacity. The sociodemographic variables considered were: age group (grouped into 60–64, 65–69, 70–74, 75–79, and 80 years or older); race/skin color (white, brown, and Black); educational attainment (incomplete elementary school, complete elementary school, complete high school, and complete higher education); and marital status (single, married, divorced, and widowed).

Regarding behaviors and health status, the following variables were analyzed: frequency of alcohol consumption (never, less than once a month, and once or more per month); smoking status (never smoked, former smoker, and current smoker); physical activity during leisure time (classified as meeting or not meeting recommended physical activity levels, according to guidelines of 150 minutes per week of moderate-intensity activity or 75 minutes of vigorous-intensity activity); and self-rated health (dichotomized into fair, good, and very good, or poor and very poor).

Information on functional capacity was classified into basic activities of daily living (ADL) and instrumental activities of daily living (IADL), according to the complexity of the tasks. The data were extracted from Module K of the PNS questionnaire, which is

designed for individuals aged 60 years or older. Limitations in ADL were assessed based on responses related to performing activities such as eating, bathing, using the restroom, dressing, moving around the home, and lying down or getting up. For IADLs, the following activities were assessed: shopping, managing finances, taking medication, visiting the doctor, and using transportation independently. Functional limitation was defined as reporting any degree of difficulty or inability to perform at least one of the assessed activities, according to the ADL or IADL classification.

Statistical Analysis

Initially, a descriptive analysis was conducted to estimate the prevalence of depression among older adults by sex (male and female), using 95% confidence intervals (95% CI) and calibrated sample weights from the 2019 National Health Survey (PNS). Subsequently, bivariate analyses were conducted between the primary outcome (presence of depression: yes/no) and the independent variables (sociodemographic, behavioral, and health-related), separately for men and women, using Pearson's chi-square test adjusted for complex sampling.

For inferential analysis, Poisson regression models with robust variance were adopted. The analyses were stratified by sex, taking into account known differences in the prevalence and determinants of depression, and estimated crude prevalence ratios (PR) and adjusted prevalence ratios (APR) with 95% CI for the association between functional disability (ADL and IADL) and the outcome. The inclusion of covariates followed the hierarchical conceptual model proposed by Victora et al.¹⁸, in three sequential blocks: (1) distal—sociodemographic factors (age, race/ethnicity, education level, marital status); (2) intermediate—behavioral factors (alcohol use, smoking, physical activity); (3) proximal—health condi-

tions (self-rated health). All analyses incorporated the complex sampling design of the PNS (*svyset, svy: poisson*) in Stata 14.0 (StataCorp, College Station, TX, USA), using a statistical significance level of $p\text{-value} < 0.05$.

Ethical Considerations

The PNS was approved by the National Research Ethics Commission (CONEP), under Opinion No. 3,529,376/2019, ensuring confidentiality and voluntary participation

through informed consent.

RESULTS

The sample consisted of 22,357 individuals aged 60 years or older. The distribution of sociodemographic and health characteristics by sex is presented in Table I. A predominance of individuals in the younger age groups within the elderly population was observed for both sexes, with the highest proportion in the 60–69 age group.

The distribution by race/skin color showed a higher proportion of older adults who self-identified as white, followed by those of mixed race and Black. Regarding educational attainment, a high proportion of individuals had not completed elementary school, especially among men (62.12%). Regarding marital status, a higher proportion of married individuals was observed among men (69.6%), while among women, widowhood was more common (37.1%).

Table I – Distribution of socioeconomic, lifestyle, and health characteristics among older adults by sex. Brazil, 2019.

	Male			Female		
	n	%	95% CI	n	%	95% CI
Age Group						
60–64	3.201	31,78	30,25–33,36	3.601	30,52	29,15–31,93
65–69	2.601	25,77	24,39–27,20	3.152	24,83	23,62–26,07
70–74	1.878	17,97	16,76–19,25	2.334	18,21	17,13–19,34
75–79	1.300	12,04	11,10–13,04	1.645	12,04	11,11–13,03
80 and over	1.213	12,44	11,43–13,52	1.803	14,41	13,37–15,52
Race / skin color						
White	4.365	51,37	49,61–53,12	5.536	51,51	49,79–53,22
brown	4.575	38,76	37,17–40,38	5.426	37,57	35,97–39,20
black	1.085	9,87	8,98–10,85	1.370	10,92	9,96–11,97
Education						
incomplete elementary school	6.932	62,12	60,28–63,93	8.055	64,15	62,58–65,70
complete elementary education	883	9,36	8,41–10,40	1.128	9,65	8,80–10,58
high school graduate	1.366	16,63	15,26–18,10	1.956	15,33	14,30–16,43
Bachelor's degree	1.012	11,89	10,69–13,20	1.396	10,86	9,91–11,89
Marital status						
single	1.729	12,78	11,76–13,87	2.481	17,2	16,08–18,37
married	6.222	69,65	68,17–71,09	3.724	36,14	34,68–37,62
divorced	1.044	8,27	7,44–9,18	1.444	9,59	8,85–10,38
widower	1.198	9,3	8,50–10,18	4.886	37,08	35,67–38,52
Alcohol use						
never	6442	60,17	58,38–61,93	10654	83,33	82,09–84,51
less than once a month	1044	9,26	8,40–10,20	833	6,66	5,97–7,42
once or more per month	2707	30,57	28,83–32,37	1048	10,01	9,00–11,11
Smoking						
Never smoked	3773	35,97	34,43–37,53	6975	54,29	52,73–55,83
has ever smoked	4890	50,14	48,49–51,78	4410	36,16	34,67–37,67
currently smokes	1530	13,89	12,80–15,06	1150	9,55	8,74–10,43

Recommended AF						
no	8119	76,94	75,48–78,33	10187	81,4	80,18–82,57
yes	2074	23,06	21,67–24,52	2348	18,6	17,43–19,82
Poor health						
No	9.118	90,93	90,05–91,74	10.869	87,14	86,10–88,11
yes	1.075	9,07	8,26–9,95	1.666	12,86	11,89–13,90
Limitation in Activities of Daily Living						
No	9468	92,84	92,02–93,58	11421	90,42	89,43–91,32
yes	725	7,16	6,42–7,98	1114	9,58	8,68–10,57
Limit for AIVD						
no	8827	86,66	85,55–87,70	9641	77,33	76,07–78,54
yes	517	34,01	30,33–37,90	954	33,94	31,03–36,99

95% CI: 95% confidence interval; PA: Physical Activity; ADL: Activities of Daily Living; IADL: Instrumental Activities of Daily Living. Note: Percentage in the weighted sample. Source: Prepared by the authors using data from the National Health Survey, Brazil, 2019.

In the assessment of health status and functional capacity, positive self-assessment of health predominated among older adults of both sexes, although women reported a higher frequency of negative self-assessment (12.9%) compared to men (9.1%). Regarding functional capacity, a higher frequency of limitations in instrumental activities of daily living was observed among both men (34.0%) and women (33.9%). In contrast, a higher prevalence of limitations in activities of daily living (ADLs) was observed

among women (9.6%) compared to men (7.2%) (Table I).

The prevalence of depression was significantly higher among women (15.8%) compared to men (6.61%). Among men, the prevalence ranged from 5.25% among those aged 80 or older to 7.64% in the 65–69 age group, with no statistically significant association with age. Among women, the prevalence was higher in the younger age groups within the elderly population, reaching 18.01% among those aged 60–64 and decreasing to 11.89% among those aged 80 or older. Regarding race/skin color, a significant association with depression was observed in both sexes. Among men, the prevalence was highest among white individuals

(8.47%), followed by mixed-race individuals (4.99%) and Black individuals (4.1%). Among women, a higher prevalence was also observed among white women (18.89%), followed by mixed-race women (13.18%) and Black women (11.62%). Educational level did not show a statistically significant association with depression in either sex. Regarding marital status, a significant association was observed only among women. The prevalence of depression was 13.94% among unmarried women, 16.21% among married women, 20.69% among divorced women, and 14.99% among widows. Among men, prevalence rates ranged from 5.34% to 10.19%, with no statistically significant association (Table II).

Table II – Distribution of depression diagnoses according to socioeconomic, lifestyle, and health characteristics of older women and men. Brazil, 2019.

	Male			Female		
	n	%	95% CI	n	%	95% CI
Age Group						
60–64	3.201	31,78	30,25–33,36	3.601	30,52	29,15–31,93
65–69	2.601	25,77	24,39–27,20	3.152	24,83	23,62–26,07
70–74	1.878	17,97	16,76–19,25	2.334	18,21	17,13–19,34
75–79	1.300	12,04	11,10–13,04	1.645	12,04	11,11–13,03
80 and over	1.213	12,44	11,43–13,52	1.803	14,41	13,37–15,52
Race / skin color						
White	4.365	51,37	49,61–53,12	5.536	51,51	49,79–53,22
brown	4.575	38,76	37,17–40,38	5.426	37,57	35,97–39,20
black	1.085	9,87	8,98–10,85	1.370	10,92	9,96–11,97

Education						
incomplete elementary school	6.932	62,12	60,28–63,93	8.055	64,15	62,58–65,70
complete elementary education	883	9,36	8,41–10,40	1.128	9,65	8,80–10,58
high school graduate	1.366	16,63	15,26–18,10	1.956	15,33	14,30–16,43
Bachelor's degree	1.012	11,89	10,69–13,20	1.396	10,86	9,91–11,89
Marital status						
single	1.729	12,78	11,76–13,87	2.481	17,2	16,08–18,37
married	6.222	69,65	68,17–71,09	3.724	36,14	34,68–37,62
divorced	1.044	8,27	7,44–9,18	1.444	9,59	8,85–10,38
widower	1.198	9,3	8,50–10,18	4.886	37,08	35,67–38,52
Alcohol use						
never	6442	60,17	58,38–61,93	10654	83,33	82,09–84,51
less than once a month	1044	9,26	8,40–10,20	833	6,66	5,97–7,42
once or more per month	2707	30,57	28,83–32,37	1048	10,01	9,00–11,11
Smoking						
Never smoked	3773	35,97	34,43–37,53	6975	54,29	52,73–55,83
has ever smoked	4890	50,14	48,49–51,78	4410	36,16	34,67–37,67
currently smokes	1530	13,89	12,80–15,06	1150	9,55	8,74–10,43
Recommended AF						
no	8119	76,94	75,48–78,33	10187	81,4	80,18–82,57
yes	2074	23,06	21,67–24,52	2348	18,6	17,43–19,82
Poor health						
No	9.118	90,93	90,05–91,74	10.869	87,14	86,10–88,11
yes	1.075	9,07	8,26–9,95	1.666	12,86	11,89–13,90
Limitation in Activities of Daily Living						
no	9468	92,84	92,02–93,58	11421	90,42	89,43–91,32
yes	725	7,16	6,42–7,98	1114	9,58	8,68–10,57
Limit for AIVD						
no	8827	86,66	85,55–87,70	9641	77,33	76,07–78,54
yes	517	34,01	30,33–37,90	954	33,94	31,03–36,99

95% CI: 95% confidence interval; PA: Physical Activity; ADL: Activities of Daily Living; IADL: Instrumental Activities of Daily Living. Note: Percentage in the weighted sample. Source: Prepared by the authors using data from the National Health Survey, Brazil, 2019.

With regard to behaviors and health status, alcohol consumption was associated only among men, with a prevalence of 7.65% among those who never consumed alcohol, 4.03% among those who consumed

it less than once a week, and 5.36% among those who reported weekly consumption. As for smoking, a significant association was observed only among women, with a higher prevalence among current smokers (19.49%) compared to those who had never smoked (14.17%). Leisure-time physical activity was also associated only with women, among whom the prevalence of depression was higher

among those who were insufficiently active (16.3%) compared to those who were physically active (13.58%). Self-rated health showed a strong association with the presence of depression in both sexes. Among men who reported poor or very poor health, the prevalence of depression was 24.68%, compared to 6.89% among those with a better perception of health. Among women, these prevalences

were 20.49% and 5.79%, respectively (Table II).

According to functional capacity, individuals with limitations in basic activities of daily living (ADL) had substantially higher prevalences of depression. Among men with ADL limitations, the prevalence was 24.36%, compared to 6.3% among those without limitations. Among women, these prevalences were 19.86% and 6.64%, respectively. A similar pattern was observed for instrumental activities of daily living. Among men with limitations in IADL, the prevalence of depression was 25.25%, while among those without limitations it

was 8.83%. Among women, these prevalences were 22.51% and 5.23%, respectively (Table II).

Table III presents the results of the multivariate analysis. Among men, age group was not significantly associated with depression. Among women, a lower prevalence of depression was observed in older age groups, particularly among those aged 70 to 74 (PR = 0.77; 95% CI: 0.63–0.95) and among those aged 80 years or older (PR = 0.65; 95% CI: 0.51–0.83), when compared to the 60–64 age group. Regarding race/skin color, individuals of mixed race had a lower prevalence of depression compared to

whites in both sexes. Among women, being Black was also associated with a lower prevalence of depression (OR = 0.61; 95% CI: 0.45–0.81) compared to white women. Educational level was not associated with the outcome in either sex. Marital status was associated only among women, among whom divorced women had a higher prevalence of depression compared to single women (PR = 1.34; 95% CI: 1.03–1.75).

Table III – Prevalence ratio of depression among older adults by sex, socioeconomic characteristics, lifestyle, and health status. Brazil, 2019.

	Presence of Depression					
	Male			Female		
	RP	95% CI	p-value	OR	95% CI	p-value
Age Group						
60–64	1			1		
65–69	1,04	0,74-1,47	0,81	0,95	0,79-1,14	0,615
70–74	0,77	0,53-1,14	0,207	0,77	0,63-0,95	0,017
75–79	0,77	0,52-1,16	0,219	0,85	0,67-1,08	0,19
80 and over	0,70	0,44-1,11	0,134	0,65	0,51-0,83	0,001
Race / skin color						
white	1			1		
brown	0,61	0,46-0,79	0,001	0,69	0,59-0,79	0,001
black	0,50	0,23-1,06	0,072	0,61	0,45-0,81	0,001
Education						
incomplete fundamental	1			1		
Complete elementary	0,88	0,57-1,33	0,546	0,98	0,76-1,25	0,897
complete average	0,98	0,69-1,38	0,909	1,07	0,89-1,30	0,448
Bachelor's degree	1,26	0,86-1,84	0,241	0,87	0,69-1,09	0,248
Marital status						
single	1			1		
married	1,10	0,67-1,80	0,701	1,07	0,85-1,35	0,537
divorced	1,74	0,99-3,04	0,052	1,34	1,03-1,75	0,030
widower	1,24	0,67-2,23	0,475	1,09	0,87-1,35	0,447
Alcohol use						
never	1			1		
less than once a month	0,51	0,34-0,79	0,003	0,89	0,69-1,16	0,419
once or more per month	0,60	0,44-0,82	0,001	0,78	0,59-1,02	0,073

Smoking						
has never smoked	1			1		
has ever smoked	1,06	0,79-1,41	0,702	1,28	1,09-1,49	0,002
currently smokes	1,08	0,74-1,60	0,678	1,29	1,02-1,65	0,036
Recommended AF						
no	1			1		
yes	1,02	0,73-1,41	0,921	0,86	0,71-1,04	0,121
Poor health						
No	1			1		
yes	3,11	2,29-4,21	0,001	1,68	1,41-1,99	0,001
ADL Limitation						
no	1			1		
yes	1,67	1,19-2,34	0,003	1,21	0,99-1,49	0,056
AIVD Limitation						
no	1			1		
yes	2,32	1,69-3,19	0,001	1,35	1,15-1,59	0,001

95% CI: 95% confidence interval; PR: Prevalence Ratio; PA: Physical Activity; ADL: Activities of Daily Living; IADL: Instrumental Activities of Daily Living.

Note: Poisson regression model, accounting for a complex sampling design.

Source: Prepared by the authors using data from the National Health Survey, Brazil, 2019.

Regarding health behaviors, an association between alcohol consumption and depression was observed only among men. Those who reported consuming alcohol less than once a month had a lower prevalence of depression (PR = 0.51; 95% CI: 0.34–0.79), as did those who reported consuming alcohol one or more times per month (OR = 0.60; 95% CI: 0.44–0.82), when compared to those who never consumed alcoholic beverages. Engaging in recommended physical activity was not associated with the outcome in either sex. Smoking was associated only among women, with a higher prevalence of depression observed among both former smokers (PR = 1.28; 95% CI: 1.09–1.49) and current smokers (PR = 1.29; 95% CI: 1.02–1.65), when compared to women who had never smoked (Table III).

With regard to health status and functional capacity, a negative self-assessment of health was associated with

a higher prevalence of depression in both sexes, being more pronounced among men (PR = 3.11; 95% CI: 2.29–4.21) than among women (PR = 1.68; 95% CI: 1.41–1.99). In contrast, limitations in basic activities of daily living were associated with a higher prevalence of depression only among men (PR = 1.67; 95% CI: 1.19–2.34). Regarding limitations in instrumental activities of daily living, a significant association with depression was observed in both sexes, with a greater magnitude among men (PR = 2.32; 95% CI: 1.69–3.19) than among women (PR = 1.35; 95% CI: 1.15–1.59) (Table III).

DISCUSSION

The results of this study highlight important differences in the distribution of depression among Brazilian older adults according to sex, socio-demographic characteristics, health behaviors, health conditions, and functional capacity. Overall, a higher prevalence of depression was observed among women, as well as an association with poorer self-rated health and functional limitations. Depression is currently one of the leading causes

of disability worldwide and poses a significant challenge to health care systems, particularly in contexts of rapidly aging populations.^{4,12} In this context, understanding the social and health determinants associated with depression among older adults is essential for planning public policies aimed at promoting healthy aging.

The higher prevalence of depression among women observed in this study is consistent with findings widely described in the national and international literature on mental health in aging.^{9,13} Epidemiological studies indicate that women experience depressive symptoms more frequently and are more likely to receive a clinical diagnosis of depression throughout their lifetimes, including in advanced age. This pattern has been associated with biological, psychosocial, and cultural factors, as well as differences in how psychological distress is expressed and in the use of health services. A systematic review with a meta-analysis conducted among Brazilian older adults demonstrated a significantly higher prevalence of depression among women, corroborating the results observed in this study.¹³ Furthermore, women

tend to use health care services more frequently, which may facilitate the recognition and diagnosis of depressive disorders.²⁰

With regard to functional capacity, an association was observed between depression and limitations in activities of daily living, particularly in instrumental activities. In this context, it is worth noting that maintaining functional capacity is one of the main pillars of healthy aging and is strongly influenced by physical, social, and psychological factors throughout the life course.¹⁴ After multivariate adjustment, limitations in basic activities of daily living remained associated with depression only among men, while limitations in instrumental activities of daily living remained associated in both sexes, with a greater magnitude among men. These findings are consistent with evidence indicating a strong relationship between functionality and mental health in aging.^{7,8} Longitudinal studies demonstrate that functional limitations may increase the risk of depression, while depressive symptoms may contribute to functional decline over time.^{15,17} Furthermore, research conducted in different sociocultural contexts suggests that the loss of independence in performing daily activities can have a significant impact on self-esteem, psychological well-being, and older adults' own sense of independence.^{16,23}

A negative self-assessment of health was strongly associated with the presence of depression in both sexes, with a greater magnitude among men. The literature indicates that subjective health perception is an important overall indicator of physical and mental well-being and is consistently associated with various adverse health outcomes. Studies have shown that depressive symptoms can influence how individuals perceive their own health, while clinical conditions and functional limitations contribute

to a poorer subjective assessment of health status.^{17,18} Research conducted with Brazilian older adults also indicates that the coexistence of depressive symptoms and multiple chronic conditions is associated with a higher prevalence of functional disabilities and a poorer quality of life.¹⁸

With regard to age, it was observed that among men there was no significant association between age group and depression after adjustment. Among women, however, a lower prevalence of depression was found in older age groups compared to the 60–64 age group. This result suggests greater vulnerability to depressive symptoms in the early stages of female aging. International evidence indicates that the transition to old age may be accompanied by significant changes in the structure of social roles, including retirement, changes in family relationships, and a reduction in the active social network—factors that may increase emotional vulnerability at this stage of life. A study conducted in high-income countries also suggests that younger women within the older adult population may experience a higher burden of stressful events and have greater difficulty adapting to the changes associated with aging. Additionally, cultural factors related to emotional expression and the stigma associated with mental disorders may influence how depressive symptoms are reported across different age groups, contributing to differences in observed prevalence.^{10,19}

With regard to race/skin color, a lower prevalence of depression was observed among Black and Brown individuals compared to White individuals. This pattern was identified in both sexes for the Brown population and among Black women after multivariate adjustment. These findings should be interpreted with caution, as they may partly reflect inequalities in access to health care and in the di-

agnosis of mental disorders. Evidence from the Brazilian context indicates that the white population makes greater use of health care services and is more likely to receive a medical diagnosis for various health conditions, including mental disorders.²⁰ Furthermore, studies have shown that the Black population faces institutional and structural barriers in accessing health care, including experiences of institutional racism and reduced access to specialized services.^{21,22} In this sense, the lower prevalence observed in this study may reflect, at least partially, processes of underdiagnosis or underreporting related to racial inequalities in health care. Recent reviews also indicate that structural racism can influence both access to and the quality of care received by the Black population.²²

Regarding marital status, a significant association with depression was observed only among women, among whom those who reported being divorced had a higher prevalence of the outcome compared to single women. This result reinforces the importance of social support networks for mental health during aging. Studies indicate that stable social relationships and family support act as protective factors against depressive symptoms among older adults, contributing to greater psychological well-being and better adaptation to the changes associated with aging. A study conducted with Brazilian older adults demonstrated that the perception of available support in situations of functional dependence was associated with lower levels of depressive symptoms, highlighting the role of social support as an important determinant of mental health in old age.¹¹

With regard to health behaviors, an association between alcohol consumption and depression was observed only among men, with a lower prevalence of the outcome identified among those who reported occasional

or monthly consumption compared to those who never consumed alcohol. This result suggests a complex relationship between alcohol consumption and mental health, as previously described in epidemiological studies. Longitudinal studies indicate that the relationship between alcohol consumption and depression can take on different patterns, including bidirectional associations, depending on frequency, social context, and associated individual factors.²⁴ In some contexts, moderate alcohol consumption may be associated with greater social participation and interaction in group activities—factors that may protect mental health. However, it is important to note that such associations should be interpreted with caution, since excessive alcohol consumption remains a recognized risk factor for various adverse health outcomes.

With regard to smoking, an association with depression was observed only among women, with a higher prevalence among current smokers and former smokers compared to those who had never smoked. Studies have shown that smoking and depressive disorders often coexist and may have bidirectional relationships. Evidence suggests that individuals with depressive symptoms are more likely to start or continue smoking, while nicotine use may also influence neurobiological mechanisms associated with mood regulation. Furthermore,

social and behavioral factors associated with smoking may act as mediators in the relationship between mental health and lifestyle.

Taken together, the findings of this study reinforce the notion that depression in the elderly population is a multifactorial phenomenon, influenced by complex interactions among sociodemographic, behavioral, clinical, and functional factors. In this regard, mental health prevention and care strategies targeting the elderly population should consider not only the presence of depressive symptoms but also aspects related to functionality, perceived health, and social conditions that influence the aging process.

Certain limitations should be considered when interpreting the results. Because this is a cross-sectional study, it is not possible to establish causal relationships between depression and the factors investigated, particularly regarding the relationship between depressive symptoms and functional limitations. Furthermore, the diagnosis of depression was based on self-reports of a previous medical diagnosis, which may be subject to memory bias and underreporting. Nevertheless, the use of data from a large-scale population survey contributes to the robustness of the presented estimates and to the understanding of the determinants of depression among older adults in the Brazilian context.

CONCLUSION

The results of this study show that depression among Brazilian older adults is unevenly distributed according to sex, sociodemographic characteristics, behaviors, health conditions, and functional capacity. A higher prevalence of the outcome was observed among women, along with significant associations with marital status, smoking, negative self-rated health, and functional limitations. Among men, notable associations were found between depression and alcohol consumption, poorer perceived health, and limitations in activities of daily living, particularly instrumental activities. These findings reinforce the notion that depression in old age is a multifactorial phenomenon, strongly influenced by social, behavioral, and health-related factors.

From a public health perspective, the results highlight the importance of strategies for the early identification and monitoring of depression in primary health care, especially among the most vulnerable groups and among older adults with poorer perceived health and loss of functionality. Given the rapid aging of Brazil's population, the incorporation of integrated approaches that address mental health, functional ability, and social conditions is essential for promoting healthy aging and reducing health inequalities among older adults.

REFERENCES

1. Silva MT, Galvao TF, Martins SS, Pereira MG. Prevalence of depression morbidity among Brazilian adults: a systematic review and meta-analysis. *Rev Bras Psiquiatr.* 2014; 36(3):262-270.
2. Ministério da Saúde (BR). Boletim Epidemiológico de Saúde Mental: Panorama da Depressão no Brasil. Brasília: Ministério da Saúde; 2022.
3. Silva AGD, Andrade FMDD, Ribeiro EG, Malta DC. Temporal trends of morbidities, and risk and protective factors for noncommunicable diseases in elderly residents in Brazilian capitals. *Rev Bras Epidemiol.* 2023; 26:e230009.
4. Vos T, Lim SS, Abbafati C, Abbas KM, Abbasi M, Abbasifard M, et al. Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease

Study 2019. *Lancet*. 2020; 396(10258):1204–1222.

5. Lu S, Liu T, Wong GHY, Leung DKY, Sze LCY, Kwok WW, et al. Health and social care service utilization and associated expenditure among community-dwelling older adults with depressive symptoms. *Epidemiol Psychiatr Sci*. 2021; 30:e10

6. Read JR, Sharpe L, Modini M, Dear BF. Multimorbidity and depression: a systematic review and meta-analysis. *J Affect Disord*. 2017; 221:36–46.

7. Amlak BT, Getinet M, Getie A, Kebede WM, Tarekegn TT, Belay DG. Functional disability in basic and instrumental activities of daily living among older adults globally: a systematic review and meta-analysis. *BMC Geriatr*. 2025; 25(1):413.

8. Ormel J, Rijdsdijk FV, Sullivan M, van Sonderen E, Kempen GI. Temporal and reciprocal relationship between IADL/ADL disability and depressive symptoms in late life. *J Gerontol B Psychol Sci Soc Sci*. 2002; 57(4):P338–P347.

9. Salk RH, Hyde JS, Abramson LY. Gender differences in depression in representative national samples: a meta-analysis. *Psychol Bull*. 2017; 143(8):783–822.

10. Moraes RSAMD, Silva DAS, Oliveira WFD, Peres MA. Social inequalities in the prevalence of common mental disorders in adults: a population-based study in Southern Brazil. *Rev Bras Epidemiol*. 2017; 20(Supl. 1):43–56.

11. Ribeiro PCC, Alves FC, Lourenço RA. Sintomas depressivos associados à expectativa de apoio social em idosos: dados do estudo FIBRA-RJ. *Psicol Clin*. 2021; 33(2):379–396.

12. Santomauro DF, Herrera AMM, Shadid J, Zheng P, Ashbaugh C, Pigott DM, et al. Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. *Lancet*. 2021; 398(10312):1700–1712.

13. Barcelos-Ferreira R, Izbicki R, Steffens DC, Bottino CMC. Depressive morbidity and gender in community-dwelling Brazilian elderly: systematic review and meta-analysis. *Int Psychogeriatr*. 2010; 22(5):712–726.

14. World Health Organization. World report on ageing and health. Geneva: WHO; 2015.

15. Wang S, Yu M, Huang W, Wang T, Liu K, Xiang B, et al. Longitudinal association between ADL disability and

depression in middle-aged and elderly: national cohort study. *J Nutr Health Aging*. 2025; 29(2):100450.

16. Takele MD, Eriku GA, Merawie DM, Zinabu FS, Fentanew M, Belay GJ, et al. Functional disability and its associated factors among community-dwelling older adults living in Gondar Town, Ethiopia: a community-based cross-sectional study. *BMC Public Health*. 2024; 24(1):647.

17. Buss SS, Aponte Becerra L, Trevino J, Fortier CB, Ngo LH, Novak V. Depressive symptoms exacerbate disability in older adults: a prospective cohort analysis of participants in the MemAID trial. *PLoS One*. 2022; 17(11):e0278319.

18. Da Rosa PPS, Marques LP, Corrêa VP, De Oliveira C, Schneider IJC. Is the combination of depression symptoms and multimorbidity associated with the increase of the prevalence of functional disabilities in Brazilian older adults? *Front Aging*. 2023; 4:1188552.

19. Moreno X, Gajardo J, Monsalves MJ. Gender differences in positive screen for depression and diagnosis among older adults in Chile. *BMC Geriatr*. 2022; 22(1):54.

20. Cobo B, Cruz C, Dick PC. Desigualdades de gênero e raciais no acesso e uso dos serviços de atenção primária à saúde no Brasil. *Cien Saude Colet*. 2021; 26(9):4021–4032.

21. Werneck J. Racismo institucional e saúde da população negra. *Saude Soc*. 2016; 25(3):535–549.

22. Hamed S, Bradby H, Ahlberg BM, Thapar-Björkert S. Racism in healthcare: a scoping review. *BMC Public Health*. 2022; 22(1):988.

23. Aguiar BM, Silva PO, Vieira MA, Costa FM, Carneiro JA. Evaluation of functional disability and associated factors in the elderly. *Rev Bras Geriatr Gerontol*. 2019; 22(5):e190045.

24. Yu X, Gain EP, Ajoku MJ, Kedia SK. Bidirectional associations between alcohol drinking and depressive symptoms among US adults aged 50 to 75: the US Health and Retirement Study. *Healthcare (Basel)*. 2024; 13(1):53.

25. Harvey SB, Overland S, Hatch SL, Wessely S, Mykletun A, Hotopf M. Exercise and the prevention of depression: results of the HUNT cohort study. *Am J Psychiatry*. 2018; 175(1):28–36.