

Original Research

Disability, Functional Limitations, and Family Violence among Older Adults in Brazil: A Cross-Sectional Study Using National Health Survey Data, Brazil 2019

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Abstract

Elder abuse is a global public health issue, with consequences on individual health, increased burden on healthcare systems, and high social costs. The study aimed to estimate the prevalence of family violence among older adults in Brazil and analyze its association with disability, comorbidities, functional limitation, and sociodemographic characteristics. Cross-sectional study using data from the 2019 National Health Survey (PNS 2019), including older adults aged 60 years or older. Bivariate and multiple logistic regression analyses were used to test the association between disability, functional limitations, and 12-month family violence, adjusting for confounders using two distinct models. Crude and adjusted odds ratios (OR and AOR) were estimated using Stata version 17.0. A significance level of $p < 0.05$ was adopted. Prevalence of family violence among older adults in Brazil was 5.0% (95% CI: 4.5-5.6).



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Individuals with disabilities had higher adjusted odds of experiencing violence (AOR = 1.7; 95% CI: 1.4-2.2), as well as those with three or more comorbidities (AOR = 2.89; 95% CI: 2.1-3.9). Individuals with severe or moderate functional limitations had higher odds of experiencing family violence (AOR = 1.5; 95% CI: 1.2-2.0) in the model adjusted for sociodemographic factors only. Women and individuals with lower educational attainment were also more likely to experience family violence. The presence of disability and functional limitation is strongly associated with family violence against older adults, reflecting greater dependency on care. These findings reinforce the need for public policies and targeted interventions to protect and promote the health of vulnerable older populations, with an emphasis on the promotion and maintaining functional independence, especially through physical activity.

Keywords

Elder abuse; persons with disabilities; comorbidity; functional status

1. Introduction

Elder abuse is a major global health issue [1], particularly in the context of population aging [2], due to its serious and far-reaching consequences for health, quality of life [1, 3-5], and mortality [6]. It is a complex, multifactorial phenomenon that affects individuals across different social strata [2] and arises from the interplay between individual vulnerabilities, dependency relationships, and broader family and social contexts [7-9]. Over the life course, the accumulation of chronic conditions tends to increase frailty [10, 11] and functional dependence in later life. Widely used theoretical models [12-15] posit that functional dependence plays a central role in the emergence of family violence [12, 13], as it intensifies caregiver burden and stress [12], thereby fostering conditions that may increase the likelihood of violent dynamics within the household [11, 12].

Evidence further supports this theoretical framework, as studies consistently report higher prevalence rates of violence among older adults with disabilities and functional limitations. A meta-analysis conducted by Yon et al. [1], including studies from 28 countries, reported a higher prevalence of abuse among older adults with disabilities compared to those without such conditions. Similarly, a systematic review identified functional limitations as a significant factor associated with violence in later life [16]. Other studies have indicated that older adults with disabilities or functional impairments are more exposed to violence due to their increased dependence on care [5, 9, 16-19]. Additional studies have also documented greater exposure to violence among older women, individuals with lower educational attainment, and residents of urban areas [20].

Despite these advances, important gaps remain in the literature. Few studies have examined the prevalence of violence in relation to the co-occurrence of disabilities and other chronic conditions [5, 21, 22], particularly at the national level [5, 21]. Existing analyses often focus on a single health condition [23] or provide only descriptive prevalence estimates, without rigorously assessing the strength and direction of associations. Such approaches are limited, as chronic conditions tend to accumulate and interact over time within complex causal pathways. Moreover, functional status is considered a key component of overall health assessment in older adults and a central element for

public policy development [24], underscoring the need to incorporate it into analyses of violence in later life.

In Latin America, studies on violence against older adults are predominantly descriptive, with prevalence estimates varying across countries and sociodemographic groups [1]. In Colombia, a national study estimated an overall prevalence of elder abuse of 15.1%, with higher rates among women, individuals with lower educational attainment, and those with functional dependence [23]. In Mexico, the prevalence of abuse among older adults with disabilities, but without cognitive limitations, was estimated at 32.1%, with higher rates among those with three or more disabilities [25]. In Brazil, the literature remains limited and largely confined to specific urban settings. In Natal (RN), in the Northeast region of Brazil, a multicenter study reported a 10% prevalence of psychological violence perpetrated by family members against individuals aged 65-74 years [26]. In Florianópolis (SC), in the Southern region, the prevalence was 12.4%, with higher odds of violence among women, individuals with lower educational attainment, those who were single or divorced, those with cognitive impairment, and those with moderate to severe functional limitations [27].

Hence, this study aimed to estimate the prevalence of family violence and examine its association with disability, comorbidities, functional limitations, and sociodemographic characteristics among older adults in Brazil. We hypothesized that the co-occurrence and greater severity of chronic conditions, particularly in socioeconomically disadvantaged contexts, would increase the likelihood of family violence. Despite the inherent limitations of a cross-sectional design and the use of self-reported measures, this study contributes to a better understanding of the magnitude of family violence and its associated factors in later life, thereby informing prevention and intervention strategies [1, 16].

2. Materials and Methods

We conducted a cross-sectional study using data from the 2019 National Health Survey (Pesquisa Nacional de Saúde – PNS). Data were collected through household-based face-to-face interviews between August 2019 and March 2020. Cluster sampling was carried out in three stages: the selection of census tracts (Primary Sampling Units – PSUs), private households, and finally, one randomly selected resident aged 15 years or older per household. A total of 86,820 interviews were conducted [28].

The initial sample included 21,728 older adults aged 60 years or older. After excluding those whose interviews were not answered directly by the individual or for whom privacy could not be ensured during the interview (i.e., in the presence of other household members or relatives), the final sample consisted of 19,746 individuals. These criteria were adopted to minimize information bias in the collection of family violence data. The reduction in sample size did not compromise the representativeness of the subsample focused on family violence. Figure 1 provides a detailed description of the sample.

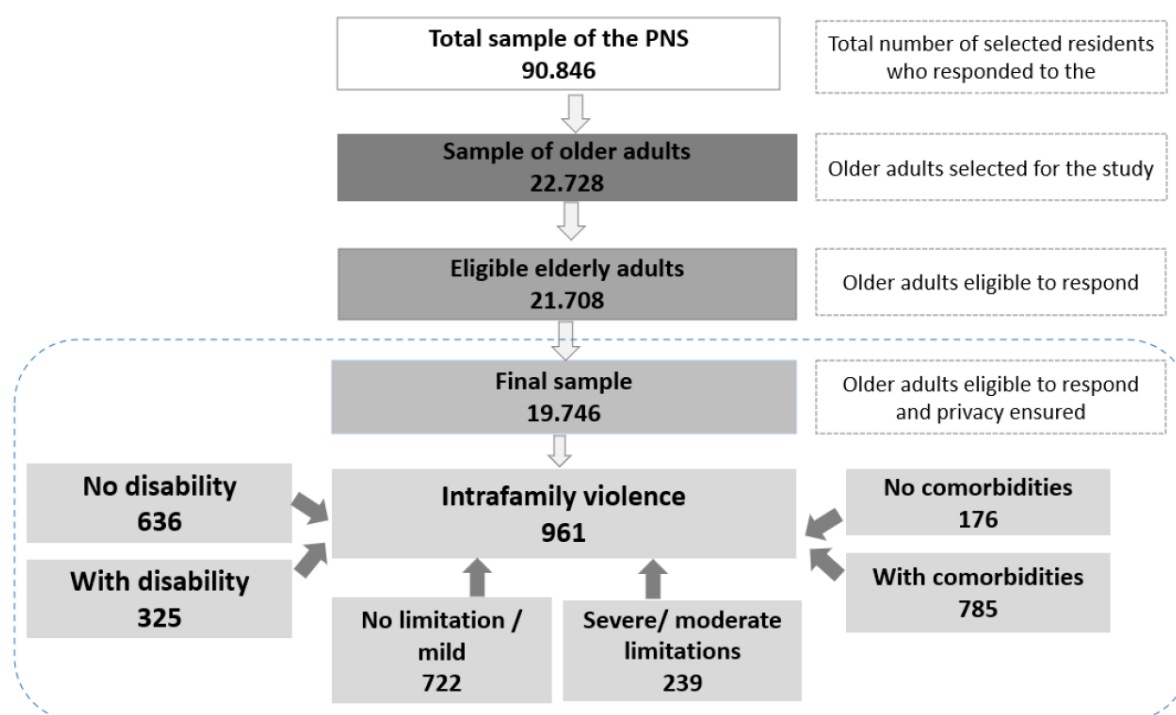


Figure 1 Sample of Brazilian older adults who reported family violence.

2.1 Independent Variables

2.1.1 Disability

Disability was identified based on self-reported functional difficulties in motor, hearing, visual, and intellectual domains. The disability indicators used in the PNS were derived from the Washington Group Short Set on Functioning (WG-SS) and the Washington Group Short Set on Functioning – Enhanced (WG-SS Enhanced), developed by the Washington Group on Disability Statistics and adopted by the Brazilian Institute of Geography and Statistics (IBGE) [29-31]. The incorporation of these instruments into national surveys has been documented in official methodological reports and the scientific literature [32, 33].

Disability was assessed using a set of standardized questions, as described in Table S1. Response options to each question included: “No, no difficulty”, “Yes, some difficulty”, “Yes, a lot of difficulty”, and “Yes, cannot do it at all”. Based on these questions, disability was classified according to the following criteria:

1. Presence of disability: No (those who reported having no or little difficulty in all domains); Yes (those who reported having severe difficulty or being unable to perform the activity in at least one domain).
2. Type of disability: Visual, Hearing, Motor, Intellectual.
3. Number of disabilities: None, One, Two, or more.

2.1.2 Comorbidities

Comorbidities were identified based on participants’ self-report of medical diagnoses of the following conditions: hypertension, diabetes, heart disease (myocardial infarction, angina, heart

failure, or other), stroke, asthma, arthritis/rheumatism, spinal problems, mental illness (depression, anxiety disorder, panic syndrome, schizophrenia, bipolar disorder, psychosis, obsessive-compulsive disorder [OCD] or other disorder), chronic obstructive pulmonary disease [COPD], cancer, and chronic kidney failure (Table S1).

Each participant was asked whether a physician had ever diagnosed them with each of the aforementioned conditions, with response options being “yes” or “no”. Comorbidities were categorized as: none, one, two, or three or more, as adopted in previous studies, such as Schmidt et al. [34]. This categorization aimed to assess the strength of the association between exposure variables and the outcome.

2.1.3 Functional Limitation

Functional limitation was defined based on the self-reported presence of at least one moderate or severe difficulty in performing basic activities (eating, bathing, dressing, using the toilet, putting on shoes, walking, or getting up) or instrumental activities of daily living (shopping, managing finances, taking medication, attending medical appointments, or using transport). Functional status was assessed using questions about basic and instrumental activities of daily living (ADLs and IADLs), as described in Table S1.

The variable was classified as: None or mild; Moderate (having great difficulty performing any daily activity); and Severe (being unable to perform any daily activity independently).

2.1.4 Socioeconomic Characteristics

The following variables were considered: (1) Sex: Male; Female; (2) Age group: 60-74 years; 75 years and over; (3) Marital status: Married; Other (including divorced/separated, widowed, and single); (4) Income (in minimum wage per capita): Up to 1; Between 1 and 3; More than 3; (5) Employment status: No; Yes; (6) Education level: Up to completed primary education; incomplete/complete secondary education and incomplete/complete higher education; (7) Ethnic group: Black (Brown and Black); Non-Black (White, Asian, and Indigenous); (8) Number of household residents: Up to 5; 6 or more; (9) Area of residence: Rural; Urban; (10) Brazilian regions: North, Northeast, Central-West, Southeast, South.

2.2 Dependent Variable

2.2.1 Family Violence

Family violence was defined based on self-reported experiences of psychological, physical, or sexual violence perpetrated by family members, regardless of the location of the incident, within the past 12 months. This concept differs from domestic violence, which refers to violence occurring within the household setting, irrespective of a familial relationship between victim and perpetrator. It may include incidents involving non-relatives or even strangers [35].

Family violence was assessed using a set of standardized questions addressing psychological, physical, and sexual violence, as detailed in Table S1. The outcome was categorized as a binary variable: No; Yes (for individuals who reported experiencing any type of violence).

2.3 Statistical Analysis

Prevalence estimates of the variables of interest and bivariate associations with family violence were calculated using the Rao-Scott corrected χ^2 test for complex sampling ($p < 0.05$). Results were presented as odds ratios (OR) with 95% confidence intervals.

To guide the multivariable analysis, a Directed Acyclic Graph (DAG) was developed a priori based on the literature (Figure S1) [36], representing the hypothesized causal relationships among disability, comorbidities, functional limitation, sociodemographic factors, and family violence. In this framework, functional limitation was conceptualized as a potential intermediate variable in the pathway linking disability and multimorbidity to family violence.

Multiple logistic regression models were constructed sequentially. Model 1 included functional limitation and sociodemographic variables. In Model 2, disability and comorbidities were added to assess their independent associations and to explore potential mediation by functional limitation, consistent with the DAG structure.

Variable inclusion was primarily guided by the a priori causal structure represented in the DAG. At the same time, a more liberal significance threshold ($p < 0.20$) was applied to avoid premature exclusion of potentially relevant covariates [37].

Model fit was evaluated using several procedures. Overall goodness-of-fit was assessed using the F-adjusted mean residual test for survey-weighted logistic regression [38]. Model specification was examined using the link test [39]. Model discrimination was evaluated using the area under the receiver operating characteristic (ROC) curve. In addition, multicollinearity diagnostics were conducted using variance inflation factors (VIF), which assess linear dependencies among predictors [40]. Because VIF estimation is not available after survey-weighted regression in Stata, diagnostics were performed using equivalent unweighted models.

Records with missing data on any variable were excluded from the multivariable analysis. Missingness affected only three observations on per capita household income. All analyses were conducted using the *survey* module in Stata, version 17, applying appropriate sampling weights.

2.4 Ethics Statement

The study used secondary, anonymized data from the Brazilian National Health Survey - PNS 2019, which are publicly available on the website of the Brazilian Institute of Geography and Statistics (IBGE). The anonymized data are available for unrestricted open-access research use. No special authorization was required to access or use the data.

The PNS 2019 project, which originated the dataset used in this study, was approved by the National Commission for Ethics in Research (CONEP)/National Health Council (CNS) under Opinion No. 3,529,376, issued on August 23, 2019 [28].

3. Results

Family violence was reported by 5.0% (95% CI: 4.5-5.6) of respondents. The distribution of family violence was not uniform across sociodemographic groups. Bivariate analysis indicated higher prevalence rates among females (7.0%; 95% CI: 6.2-7.9), unmarried individuals (5.9%; 95% CI: 5.1-6.8), those with lower educational attainment (5.7%; 95% CI: 5.0-5.8), and individuals with per capita household income of up to one minimum wage (5.6%; 95% CI: 4.8-6.7). No significant

differences in prevalence were observed according to age, ethnic group, area of residence, employment status, or household composition (Table 1). Regional estimates showed limited variability around the national prevalence (Figure 2).

Table 1 Prevalence of family violence among Brazilian older adults and its association with sociodemographic variables.

Sociodemographic Characteristics	Family Violence ^a					
	Prevalence			Association		
	n	%	(95% CI)	p-value	Crude OR	(95% CI)
Sex						
Male	235	2.40	(2.00-2.90)	<0.001	Ref.	
Female	726	7.00	(6.20-7.90)		2.98	(2.38; 3.74)
Age group						
60-74	798	5.30	(4.70-5.80)	0.189	Ref.	
75+	163	4.20	(3.10-5.80)		0.80	(0.57-1.12)
Ethnic Group ^b						
Non-Black	416	4.70	(4.10-5.40)	0.200	Ref.	
Black	545	5.40	(4.60-6.20)		1.15	(0.93-1.42)
Marital Status						
Married	387	4.20	(3.60-4.80)	0.002	Ref.	
Other ^c	574	5.90	(5.10-6.80)		1.43	(1.14-1.78)
Income (in minimum wage per capita) ^d						
Up to 1	448	5.60	(4.80-6.70)	0.033	Ref.	
Between 1 and 3	384	4.90	(4.20-5.70)		0.87	(0.68-1.09)
More than 3	128	3.70	(2.90-4.80)		0.65	(0.47-0.89)
Employment status						
No	724	5.20	(4.60-5.90)	0.298	Ref.	
Yes ^e	237	4.60	(3.70-5.60)		0.88	(0.68-1.12)
The education level ^f						
Up to completed primary education	714	5.70	(5.00-6.40)	<0.001	Ref.	
Secondary/higher education	247	3.60	(3.60-4.30)		0.62	(0.49-0.78)
Area of residence						
Rural	201	4.60	(3.90-5.60)	0.391	Ref.	
Urban	760	5.10	(4.50-5.70)		1.10	(0.88-1.39)
Number of household residents						
Up to 5	933	5.00	(4.40-5.50)	0.142	Ref.	
6 or more	28	7.20	(4.40-11.70)		1.50	(0.87-2.58)

Note: Bivariate associations were analyzed using a chi-squared test with the second-order Rao–Scott correction for complex survey sampling design. Weighted survey counts were rounded to the nearest whole number.

^a Includes only violence perpetrated by family members (spouse or partner; ex-spouse or ex-partner; boyfriend/girlfriend, ex-boyfriend/ex-girlfriend; son/daughter, stepson/stepdaughter; sibling; or other relative).

^b Ethnic Group: Black (Brown and Black); Non-Black (White, Asian, and Indigenous). “The ‘yellow’ (Asian) and Indigenous populations were grouped with the ‘non-black’ category due to their small sample sizes.”

^c Marital status [other] includes divorced/separated (legally or de facto), widowed, and single individuals.

^d N = 960 older adults, as one individual in this group did not meet the specified category criteria.

^e Employed refers to those who reported having one to three jobs in the reference week of the survey.

^f Education: Up to completed primary education; secondary/higher education (complete or incomplete).

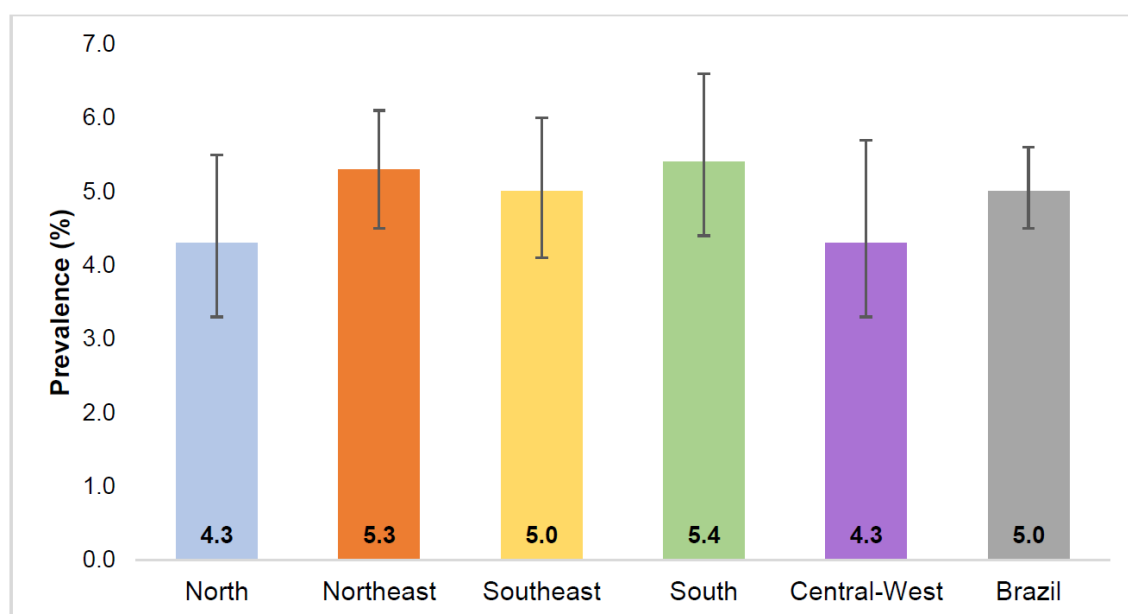


Figure 2 Prevalence of family violence among older adults in Brazil, by region.

Older adults with any reported disability had 2.4-fold (95% CI: 1.9-3.0) higher odds of reporting family violence compared to those without disabilities. All disability types, except hearing impairment, were associated with odds ratios (ORs) of reporting family violence exceeding 2.0. Although prevalence varied across disability types, confidence intervals overlapped, and no statistically significant differences were observed (Table 2).

Table 2 Prevalence of family violence among Brazilian older adults and its association with disability, functional limitation, and comorbidities.

	Family Violence ^a					
Health characteristics	Prevalence			Association		
	n	%	(95% CI)	p-value	Crude OR	(95% CI)
Disability						
No	636	4.00	(3.50-4.50)	<0.001	Ref.	
Yes ^b	325	9.10	(7.50-10.90)		2.38	(1.87-3.04)
Type of disability						
Visual	154	10.44	(7.47-14.40)	<0.001	2.43	(1.65-3.57)
Hearing	33	6.96	(4.04-11.74)	0.231	1.43	(0.79-2.58)
Motor	231	9.89	(7.88-12.33)	<0.001	2.49	(1.89-3.28)
Intellectual	12	10.60	(5.43-19.69)	0.025	2.26	(1.09-4.69)
Any disability	325	9.06	(7.49-10.91)	<0.001	2.38	(1.87-3.04)
Number of disabilities						
None	636	4.01	(3.54-4.54)	<0.001	Ref.	
One	229	8.04	(6.66-9.69)		2.09	(1.64-2.67)
Two or more	96	12.46	(8.05-18.78)		3.41	(2.06-5.63)
Functional limitation						
None or Mild	722	4.54	(4.05-5.09)	<0.001	Ref.	
Moderate to Severe	239	7.50	(5.89-9.51)		1.71	(1.28-2.27)
Comorbidities						
None	176	2.76	(2.23-3.43)	<0.001	Ref.	
One or two	475	4.31	(3.76-4.94)		1.58	(1.22-2.07)
Three or more	310	10.45	(8.71-12.49)		4.10	(3.04-5.54)

Note: Bivariate associations were analyzed using the chi-squared test with second-order Rao-Scott correction for complex survey sampling design. Weighted survey counts were rounded to the nearest whole number.

^a Includes only violence perpetrated by family members (spouse or partner; ex-spouse or ex-partner; boyfriend/girlfriend, ex-boyfriend/ex-girlfriend; son/daughter, stepson/stepdaughter; sibling; or other relative).

^b Corresponds to older adults who reported having great difficulty (moderate) or being completely unable (severe) to perform tasks related to body functions in the motor, hearing, visual, or intellectual domains.

A dose-response pattern was observed with increasing severity and number of disabilities and comorbidities. Individuals reporting two or more disabilities had 3.4-fold (95% CI: 2.6-5.6) higher odds of experiencing family violence compared to those without disabilities. Likewise, having three or more comorbidities was associated with 4.1-fold (95% CI: 3.0-5.5) higher odds, while moderate or severe functional limitations were also associated with a 71% (95% CI: 1.3-2.3) increase in the odds of reporting family violence (Table 2).

Multiple logistic regression analyses were conducted using two sequentially adjusted models (Table 3). In the fully adjusted model (Model 3), female sex, higher educational attainment, and age above 75 years remained independently associated with reporting family violence (Table 3).

Table 3 Multiple regression analyses of the associations between sociodemographic and health characteristics with family violence among older adults in Brazil.

Characteristics	Family violence (past 12 months)					
	No adjustment		Model 1 ^a		Model 2 ^b	
			Sociodemographics		Model 1 +	
			Functional limitation		Comorbidities Disability	
	OR	(95% CI)	AOR	(95% CI)	AOR	(95% CI)
1. Sociodemographic						
Sex						
Male	Ref.				Ref.	
Female	2.98³	(2.38-3.74)	2.85³	(2.27-3.57)	2.47³	(1.97-3.11)
Age group						
60 to 74	Ref.				Ref.	
75 or older	0.80	(0.57-1.12)	0.66²	(0.48-0.91)	0.66²	(0.48-0.91)
Education ^c						
Up to completed primary education	Ref.				Ref.	
Secondary/higher education	0.62³	(0.49-0.78)	0.64³	(0.51-0.81)	0.67³	(0.53-0.85)
2. Health						
Functional limitation						
None or mild	Ref.		Ref.		Ref.	
Moderate or Severe	1.71³	(1.28-2.27)	1.52²	(1.15-1.99)	0.98	(0.75-1.28)
Comorbidities						
None	Ref.				Ref.	
One or two	1.58³	(1.22-2.07)			1.40²	(1.07-1.84)
Three or more	4.10³	(3.04-5.54)			2.89³	(2.14-3.90)
Disability						
No	Ref.				Ref.	
Yes ^d	2.38³	(1.87-3.04)			1.72³	(1.35-2.19)

Note: Abbreviation: OR - Crude Odds Ratio; AOR - Adjusted Odds Ratio; Ref. - Reference category.

¹ p-value < 0.05; ² p-value < 0.01; ³ p-value < 0.001.

Multiple Logistic Regression. The Area Under the ROC Curve (AUC) was used to assess the sensitivity and specificity of the logistic regression models, which demonstrated approximately 70% accuracy in predicting the outcome: Model 1 (AUC = 0.65; 95% CI: 0.62-0.67) and Model 2 (AUC = 0.69; 95% CI: 0.67-0.72).

^a Model 1 - adjusted by sociodemographic factors (sex, age group, and education) + functional limitation.

^b Model 2 - adjusted by Model 1 + Comorbidities + Disability.

^c Education: Up to completed primary education; secondary/higher education (complete or incomplete).

^d Corresponds to older adults who reported having great difficulty (moderate) or being completely unable (severe) to perform tasks related to body functions in the motor, hearing, visual, or intellectual domains.

Women had 2.5-fold (95% CI: 1.97-3.11) higher odds of reporting family violence compared to men. In contrast, having a secondary or higher level of education was associated with lower odds of family violence victimization (AOR = 0.67; 95% CI: 0.53-0.85). Age 75 years or older became statistically significant after adjusting for other covariates, indicating lower odds of experiencing violence (AOR = 0.7; 95% CI: 0.5-0.9).

Functional limitation was associated with 52% (95% CI: 1.15-1.99) higher odds of experiencing family violence in Model 2, but this association became non-significant after adjusting for comorbidities and disabilities. In contrast, disability (AOR = 1.72; 95% CI: 1.35-2.19) and multimorbidity (AOR = 2.89; 95% CI: 2.14-3.90) remained independently associated with the outcome in the fully adjusted model (Table 3).

Model diagnostics indicated adequate fit. Survey-adjusted goodness-of-fit test showed no evidence of lack of fit ($p = 0.309$). The link test did not suggest model misspecification ($\chi^2 p = 0.856$), and the area under the receiver operating characteristic curve (AUC) was estimated at 0.7 (Figure S2), indicating acceptable discriminative capacity to distinguish between older adults who reported family violence and those who did not. No evidence of problematic multicollinearity was observed among the independent variables ($VIF < 3$).

4. Discussion

The findings indicate that family violence against older adults in Brazil is associated with heightened health vulnerability and sociodemographic disadvantage. Although the observed prevalence aligns with global estimates (4-6%) [41], its distribution is uneven, disproportionately affecting specific subgroups, particularly individuals with disabilities, multiple comorbidities, functional limitations, women, and those with lower educational attainment [4, 5, 42, 43]. These findings reinforce the unequal nature of family violence in later life. They should be interpreted within a broader framework that encompasses the social determinants of health and Brazil's current socioeconomic context.

4.1 Disability, Comorbidities, and Functional Limitation

The positive association between disability and family violence, which remained significant after adjustment for potential confounders, is consistent with the international literature [1, 5, 27, 42, 44, 45]. Similar to the present findings, a study conducted in India [5] reported that older adults with two or more disabilities had 2.4-fold higher odds of experiencing family violence. Together, these findings reinforce that disability constitutes a significant marker of vulnerability to violence within the family context, particularly when accompanied by increased care dependency.

In addition, a greater number of comorbidities and more severe functional limitations were associated with higher odds of family violence, in line with previous studies [2, 9, 18, 21, 46]. The observation that individuals with three or more comorbidities were more likely to be victims of

family violence, consistent with findings reported in India [21], suggests that the accumulation of multiple health conditions may contribute more substantially to family violence than any single disease alone, likely through increased care dependence. This pattern may reflect the greater need for care associated with multimorbidity.

The results also indicated that the association between functional limitation and family violence lost statistical significance after adjustment for comorbidities and disability, suggesting a potential mediating role of functional limitations in the relationship between chronic conditions and violence victimization. This mechanism should be interpreted as a hypothesis, consistent with prior conceptual models, rather than as evidence of causality [12-15].

Nonetheless, both the isolated and joint analyses reinforce that functional limitation is a major contributor to vulnerability to violence and should be prioritized in public policies and in prevention and protection strategies [24]. Importantly, adequate levels of functioning may be achieved regardless of the presence of comorbidities or disability, as functional status is dynamic and potentially modifiable through public policies and intersectoral actions [47, 48].

Literature acknowledges that violence against older adults has a multifactorial aetiology, involving characteristics of the individual, the perpetrator, the relational dynamics, and the broader social context [9]. At the individual level, conditions such as chronic diseases, functional dependence, and frailty increase care needs and may increase relational strain within the family due to caregiver burden [5, 13, 42, 49-51]. This mechanism of functional dependence and caregiver burden within the dynamic of intrafamilial violence is supported by the Situational Approach Theory [12, 13]. However, as documented in previous studies, these factors do not operate deterministically. Their effects depend on specific contextual conditions, including social isolation, weakened affective bonds, and a prior history of violence [50, 51].

4.2 Sex

With regard to sex differences, the study found a higher likelihood of family violence among women, corroborating the existing literature, including systematic reviews [46, 52]. Sex appears to amplify disparities in the association between disability, functional capacity, and violence against older adults [5, 53, 54]. A study conducted in India reported that older women with more than two disabilities had 3.2-fold higher odds of experiencing violence, whereas the corresponding odds ratio among men was 1.9 [5].

Gender inequalities, financial dependence, and reduced physical and mental capacity increase women's vulnerability to violence [5]. Given women's longer life expectancy, they tend to exhibit higher rates of chronic diseases, disabilities [55-57], functional limitations [5, 57], mental health conditions [5], and overall frailty compared to men [58]. They are also more likely to experience widowhood [5], considering higher mortality rates among men across the life course [59].

These findings should be interpreted in light of the gendered division of care, as caregiving responsibilities disproportionately fall on women. Caregivers often experience social isolation, elevated stress, and personal constraints [46]. The invisible and unpaid nature of caregiving may compromise health and quality of life [60], underscoring the need for material, psychosocial, and community-based support.

4.3 Marital Status

After adjustment, being married was not significantly associated with family violence, consistent with findings from other studies [5, 26]. This lack of association suggests that marital status alone may not capture the complexity of family relationships, reflecting the influence of intermediary factors, such as income, education, and residential context, within the causal pathway [5, 45].

Previous studies have indicated that marriage is associated with lower risk of family violence [16], disability [57], and functional limitation [57]. It has been suggested that marriage, particularly supportive marital relationships [24], promotes mutual protection [24], greater sharing of time, activities, leisure, and resources [61], as well as emotional bonds and social support, all of which reduce stress and encourage healthier lifestyles [61].

Evidence also indicates a higher risk of neglect and financial abuse among older adults who are separated, divorced, or living alone [16]. In particular, older individuals living alone have shown increased odds of financial abuse (OR = 2.7; 95% CI: 1.0-7.2) [16]. Although intimate partner violence does occur, children and children-in-law are identified as the primary perpetrators [62], especially in contexts marked by the individual's physical or financial dependence [13].

4.4 Sociodemographic Conditions

Regarding sociodemographic conditions, the study found an association between low educational attainment and family violence, consistent with previous studies [5, 16, 63, 64]. Education and income may function as protective factors by enabling better health conditions, greater autonomy, preserved functional capacity, and improved access to care resources, thereby reducing family strain [62]. These findings underscore the role of socioeconomic inequalities in shaping violence against older adults [62].

In the Brazilian context, adverse social determinants, such as economic instability, low income, and unequal access to health services, particularly with regard to chronic disease management and prevention, shape health trajectories across the life course, increasing health risks and diminishing quality of life [12]. Therefore, public policies that address structural determinants and promote healthy aging are essential to reduce vulnerability among older adults and improve their quality of life [57].

Employment status was not significantly associated with family violence, differing from findings reported in local studies [63]. Although continued employment may preserve health and autonomy [65], remaining in the workforce can be driven by financial necessity rather than personal choice, especially among lower-income older adults [65]. Income reduction in later life, combined with rising healthcare costs, may increase financial dependence [13]. Meanwhile, in many intergenerational households, older adults contribute substantially to family income [66], primarily through pensions and inheritance transfers [59].

4.5 Study Limitations

Given the cross-sectional design, causal relationships between the exposures examined and family violence against older adults cannot be inferred. In addition, the absence of data on neglect and financial violence in the National Health Survey (PNS), together with the exclusion of individuals with severe disabilities who were unable to respond to the questionnaire, may have led to an

underestimation of the prevalence of violence victimization. Underreporting is also likely, as violence against older adults is shaped by stigma and cultural norms, even under standardized interview conditions.

Data were collected using tablet-based questionnaires without audio recording. While this approach is appropriate for sensitive topics, it does not allow independent verification of interview conditions and may have been susceptible to the presence of other household members during data collection. To mitigate this concern, interviews conducted without privacy were excluded, resulting in a loss of approximately 10% of the sample. The remaining sample size was still robust.

The analysis was restricted to family violence because relationships with neighbors or domestic workers could not be reliably identified, which would be required to characterize domestic, rather than family violence. Finally, more detailed stratification by type of comorbidity or form of violence was not feasible due to the limited number of outcome cases, potentially reducing the precision of statistical estimates.

4.6 Contributions and Implications

Family violence against older adults is a serious public health issue with substantial impacts on families and society [3] and should be prioritized on the public agenda. By identifying factors associated with family violence in the Brazilian context, particularly chronic conditions, functional limitation, and socioeconomic inequalities, this study advances understanding of the phenomenon. It provides evidence to inform public policies and strengthen health and social assistance services for older adults.

Policies should prioritize preventing chronic diseases and functional dependence by promoting physical activity and healthy eating. Early identification of risk factors for functional decline [57], strengthening care and protection networks [66], and expanding rehabilitation services and support for victims are also essential. Furthermore, it is important to support caregiving families [66], incorporate informal caregivers into public policies, ensure social and pension protection, and promote safer urban environments, in line with the National Care Policy.

5. Conclusion

The study found a prevalence of family violence against older adults in Brazil that is consistent with global estimates, with a disproportionate burden among older adults with disabilities. Prevalence may nevertheless have been underestimated due to the exclusion of individuals with severe disabilities and the lack of data on neglect and financial abuse. Disability, multimorbidity, and severe functional limitations emerged as the main predictors of family violence and were more common among women and individuals with lower educational attainment.

These findings enhance understanding of factors associated with violence and help inform prevention and intervention strategies. Future research should examine the intersection of disability and gender, the role of employment as a potential protective factor, and the mediating effects of functional limitation and marital status across different socioeconomic contexts.

Addressing violence against older adults requires intersectoral actions involving individuals, families, and society [46]. Early identification of frailty and policies to preserve functional capacity through multilevel interventions are essential. Promoting healthy eating, resistance exercises, and

autonomy are key strategies. Supporting families and valuing aging are also important for strengthening social bonds and expanding community support networks.

Author Contributions

RMCV Souto contributed to the conception of the study, data analysis, and interpretation of the data; drafting of the manuscript and critical revision of the intellectual content and was responsible for the final approval of the version to be published. RB Corassa contributed to the conception of the study, data analysis, and interpretation of the data, and critical revision of the intellectual content. JV Souto Júnior contributed to data interpretation and critical revision of the intellectual content. EL Machado contributed to data analysis and interpretation, as well as critical revision of the intellectual content. OL Moraes Neto contributed to data analysis and interpretation, as well as critical revision of the intellectual content. All authors approved the final version of the manuscript before submission and will approve the final version to be published.

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Competing Interests

The authors have declared that no competing interests exist.

Data Availability Statement

We declare that we utilized the public database of the PNS 2019, available from the IBGE website, which can be accessed at any time by any person, with no need of previous authorization. The database can be downloaded directly from the link:

<https://www.ibge.gov.br/estatisticas/sociais/saude/9160-pesquisa-nacional-de-saude.html?=&t=downloads>.

AI-Assisted Technologies Statement

The authors used AAI Technologies to assist with language editing, including grammar correction and improvement of clarity and readability of the manuscript. No AI tools were used for data analysis, interpretation of results, or generation of scientific content. All content was reviewed and validated by the authors, who take full responsibility for the integrity and accuracy of the paper.

Additional Materials

The following additional materials are uploaded at the page of this paper.

1. Table S1: Independent and dependent variables and corresponding questions used in the analysis, based on the Brazilian National Health Survey (PNS), 2019.
2. Figure S1: Directed Acyclic Graph (DAG) or Causal Diagram of the Variables.

3. Figure S2: Model Performance Evaluation Using the ROC Curve.

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