

A Comparative Study of Prevalence and Risk Factors Associated with Depressive Symptoms in Two Long-Lived Elderly Populations in Brazil

Bárbara T. B. A. de Souza¹, Júlia C. L. Nóbrega¹, Raísa R. F. Simões¹, Juliana Barbosa¹, Ricardo A. Olinda¹, Yeda A. O. Duarte², Mayana Zatz³ & Silvana Santos¹

¹ Programa de Pós-Graduação em Saúde Pública, Universidade Estadual da Paraíba, Campina Grande, Paraíba, Brazil

² Departamento de Enfermagem, Faculdade de Saúde Pública, Universidade de São Paulo, São Paulo, Brazil

³ Departamento de Genética e Biologia Evolutiva, Universidade de São Paulo, São Paulo, Brazil

Correspondence: Dra. Silvana Santos, Programa de Pós-graduação em Saúde Pública, Universidade Estadual da Paraíba, Rua Baraúnas, Bairro Universitário, 58429500, Campina Grande, PB – Brazil. E-mail: silvanaip@gmail.com

Received: November 12, 2021 Accepted: December 8, 2021 Online Published: December 14, 2021

doi:10.5539/gjhs.v14n2p16

URL: <https://doi.org/10.5539/gjhs.v14n2p16>

Abstract

This cross-sectional study aimed to investigate and compare the prevalence and risk factors associated with depressive symptoms among long-lived elderly, aged 80 and over, in two Brazilian populations. Face-to-face interviews were performed with 417 seniors: 179 living in the poor and rural town of Brejo dos Santos, Paraíba, and 238 in one of the largest urban centers in Latin America, the city of São Paulo, São Paulo. In the rural region of Brejo dos Santos, these depressive symptoms were more associated with the family support network, co-residence, and the number of members of the social network; in São Paulo, on the other hand, depression is more associated with the elderly's difficulty in performing basic and instrumental daily-living activities and with their overall satisfaction with life. From the results obtained, it was possible to verify that a very significant portion of the longevous elderly in Brejo dos Santos, Paraíba, have symptoms that suggest depression, and it is necessary to further investigate environmental and genetic factors that could explain this observation, given that this community has a high frequency of consanguinity.

Keywords: Depression, aging, public health, longevity, developing countries

1. Introduction

Due to demographic transition, the elderly population has grown worldwide. Globally, there were 727 million persons aged 65 years or over in 2020. The number of older persons is expected to reach more than 1.5 billion in 2050 worldwide. The global proportion of elderly people aged 65 and over is projected to increase from 9.3 per cent in 2020 to around 16.0 per cent in 2050 (United Nations, 2020). In Brazil, according to the last census carried out in 2010 by the Brazilian Institute of Geography and Statistics (IBGE), people aged 65 and over represented 7.32% of the population; and, by 2050, they are expected to represent around 21.87% of the country's population (IBGE, 2010). In view of demographic changes with epidemiological consequences, one of the challenges of Public Health Care is to better understand the factors that contribute to aging and the most common diseases in this population, such as psychiatric disorders, among which is depression.

Depression is characterized by constant sadness and inability to feel pleasure in various spheres of life, concomitant with an inability to perform daily activities for at least two weeks (Dalgarrondo, 2019). The diagnosis of depressive disorder is performed by examining the signs and symptoms in the individual. Thus, depressive symptoms are often characterized by fatigue, easy and constant tiredness; loss or increase in appetite; insomnia or hypersomnia; anxiety; increased irritability; attention and concentration deficits; indecision; restlessness; feelings of worthlessness, guilt or hopelessness; and thoughts of self-injury or suicide (Dalgarrondo, 2019).

Severe, moderate, and chronic depression are associated with an increase in the death rate in the senile phase

(Schoevers et al., 2000; Vilalta-Franch et al., 2012). Furthermore, depressive disorder in the elderly can lead to anguish and disability, and represent an obstacle to successful aging, which is a multidimensional construct that includes psychological health, physical health, social support, and the ability to perform daily life tasks (Golja, Daugherty, & Kavcic, 2020). Moreover, the presence of depressive symptoms significantly reduces the quality of life, including cognitive decline, longer hospital stays and poorer health during old age (Meeks, Vahia, Lavretsky, Kulkarni, & Jeste, 2011).

In view of the epidemiological transition associated with demographic changes, the Pan American Health Organization (PAHO) developed a multicenter survey, with the purpose of investigating the living and health conditions of the elderly (60 years and over). This survey, known as the SABE study (Health, Well-being and Aging), was carried out for the first time in Brazil, in the city of São Paulo, by researchers from the Public Health Care College of the University of São Paulo, using a representative sample of the urban population aged 60 years and over of more than two thousand non-institutionalized seniors (Lebrão & Laurenti, 2005; Lebrão & Duarte, 2008). The research has been reapplied every five years, with new elderly being added to the cohort study (Lebrão & Duarte, 2008; Lebrão, Duarte, Santos, & Laurenti, 2008).

Recently, the group responsible for the SABE project established a partnership with researchers from State University of Paraíba in order to examine issues concerning longevity and human aging. In this study, the aim was to replicate the SABE study in consanguineous communities to establish the first cohort study in the region, involving an elderly population in the Northeastern semi-arid region. The town of Brejo dos Santos, which is about 400 km from the capital of the state of Paraíba, João Pessoa, was chosen, for convenience, to carry out the first phase of the SABE study in Paraíba. In this population, about 18% of marriages are consanguineous (Weller et al., 2012), and the occurrence of a genetic disease that associates intellectual disability and psychiatric disorders (Figueiredo et al., 2015), and several cases of psychiatric disorders in the investigated families were discovered.

Therefore, considering the relevance of the theme, the present work aimed to compare the prevalence and factors associated with depressive symptoms in two longevous populations, aged 80 years or more, in the rural and poor town of Brejo dos Santos, Paraíba, and in São Paulo, a large urban center in Brazil.

2. Methods

This is a cross-sectional, analytical, and quantitative study, in which longevous people were interviewed in their homes – in developing countries, this group includes people aged 80 and over (Liberalesso, Dallazen, Bandeira, & Berlezi, 2017; Willig, Lenardt, & Caldas, 2015) – in the town of Brejo dos Santos, Paraíba, and in the big city of São Paulo, São Paulo, making up a total sample of 417 people. Data were collected by using the SABE survey (Maia, 2005).

From a partnership established with the Municipal Health Department of Brejo dos Santos in Paraíba state, the necessary data were provided for the identification of 188 individuals who met the research inclusion criteria, which refer to the elderly aged 80 or more living in town; while the exclusion criteria concern institutionalized elderly and/or those who moved to another city. Due to refusals, moving to other cities and other reasons (4.79%), 179 long-lived people were effectively studied. The collection took place in the period of May 2017.

Regarding the portion of the sample corresponding to the elderly residing in São Paulo, a probabilistic sample representative of the urban population aged 60 and over was used. In previous publications, it is possible to have access to a detailed explanation about the design of the SABE study, as well as the sampling process that was used (Lebrão & Duarte, 2003). For the purposes of this study, 238 elderly people 80 years old or over who collaborated with the fourth SABE cohort, whose data was collected in 2015 participated in the sample.

This research was approved by the Research Ethics Committee of the State University of Paraíba (Comitê de Ética em Pesquisa da Universidade Estadual da Paraíba (UEPB), under the CAAE protocol number: 67426017.60000.5187 and was in accordance with the principles of Resolution number 466/12 of the National Health Council (Conselho Nacional de Saúde). All participants or their guardians received verbal and written explanations about the study procedures and, when they agreed, they signed the free and informed consent form and the institutional declaration of approval. The results were presented to the participants after the study was completed.

Variables related to mental health aspects are subjective and, due to this, could not be answered by substitute informants, thus, it was decided to verify dementia and suggestive of cognitive decline by using the Mini Mental State Examination (MMSE) (Icaza & Albala, 1999). The individuals with dementia or cognitive decline were excluded from the analytical analysis.

The dependent variable corresponds to the presence of symptoms suggesting depression, which were investigated

by using the short version of the Geriatric Depression Scale (GDS-15), developed based on the GDS-30; its validity and reliability have been analyzed and confirmed by previous studies (Wancata, Alexandrowicz, Marquart, Weiss, & Friedrich, 2006). In both data collections, carried out in Brejo dos Santos and in São Paulo, SABE used a GDS-15 questionnaire validated for use in Brazil (P. Almeida & A. Almeida, 1999). The subjects who obtained a final score greater than or equal to six (6) were classified into the group of elderly people who have symptoms suggesting depression (Andrade, Wu, Lebrão, & Duarte, 2016).

The independent variables were sociodemographic, health conditions, and psychosocial factors, including: gender (female and male), age (categorized from 80 to 89, and 90 and over), ethnicity (white or non-white), marital status (with a partner: those who were married and cohabiting, and without a partner: widowed, divorced, separated and single), literacy (yes for those who went to school and could read, and no for those who did not meet these two criteria), income (≤ 1 minimum wage and > 1 minimum wage), income sufficiency (if the elderly person considers their income sufficient for his/her expenses or not), food insufficiency up to 15 years of age (if the elderly person experienced lack of food in their first 15 years of life), number of chronic diseases (2 or more, one or none), pain (yes or no), functional status (does not walk, and does walk), difficulty in basic activities of daily living (ADLs: yes or no), difficulty in instrumental activities of daily living (IADL: yes or no), diagnosis of depression (yes or no), polypharmacy (yes or no), self-assessed health (categorized into good, fair, and poor), subjective well-being (better and worse), overall life satisfaction (greater and lesser), loneliness (yes and no), isolation (yes and no), receiving social support (yes and no), offering social support (yes and no), co-residence (yes and no), living arrangements (lives alone, only with spouse, children, children and grandchildren, other arrangements), living most of the time (with youngsters and/or teenagers, only with adults, only with elderly, or alone), number of network members (only 1, between 2 and 4, 5 or more).

For processing and analyses, the data were submitted to double entry in the Epidata 3.1 program. Statistical information was obtained by using the statistical software R (R Core Team, 2018). Initially, to list the profile of the studied population, a descriptive analysis of the data was performed, with the distribution of absolute values and the relative frequencies of each variable. Subsequently, bivariate, and multiple logistic regression analyses of the data were performed. In the bivariate analysis, Pearson's chi-square test and Fisher's exact test were used, and the selected measure of association was the odds ratio (OR). For multiple analyses, the initial logistic regression model was obtained with all variables, taking the OR and 95% confidence intervals as a measure of association (IC95%). The adjustment variables that presented $p \leq 0.20$ in the initial model were included in the final multiple analyses and in the interpretation of the results, $p < 0.05$ was considered as indicative of a statistically significant association.

3. Results

Regarding socio demographic aspects, there is a greater proportion of women in São Paulo than in Brejo dos Santos (70.6% and 54.7% respectively) who live without partners (79% and 57%). Most respondents declared themselves white (61.7% and 54.2%); belonging to the age group from 80 to 89 years old (72.7% and 78.8%) and feeling satisfied with life (87.1% and 80.8%), having a good index of subjective well-being (76.9% and 78.7%). Regarding health status, there is a greater proportion of elderly people in São Paulo who reported having two or more chronic diseases compared to those in Brejo dos Santos (73.9% and 52.5%, respectively) with less joint pain (58, 1% and 78.7%) (Table 1).

With regard to monthly income, the elderly in Brejo dos Santos mostly receive up to a minimum wage (67%); while the elderly in São Paulo has an income above this value (58.1%); and most respondents considered this income insufficient to carry out their daily activities (61% of the sample from Brejo dos Santos, and 60% of the respondents in São Paulo). In São Paulo, literate individuals are predominant (78.7%); and, in Brejo dos Santos, non-literate individuals are predominant (62%) (Table 1).

Most elderly people in São Paulo, unlike what was observed in Brejo dos Santos, report not having experienced hunger during the first 15 years of life (85.2% and 58.6%, respectively). Both declared good functional status (87.7% and 88.8%); they do not depend on other people for basic activities of daily living (72.6% and 68.5%), but they do depend on others for instrumental activities (70% and 87.2%); co-reside with other people (73.4% and 86%), among which, their own children predominate (27.5% and 25.1%). In relation to receiving and offering social support, it was lower in São Paulo (69.2% and 59.9%, respectively) than in Brejo dos Santos (81% and 77.1%, respectively). Most elderly people in both populations stated that they do not feel isolated or unattended (64.3% and 76%); however, while 54.9% of the elderly say they feel alone, in São Paulo this proportion was lower, around 41.2% (Table 1).

There were contrasts between the two populations in relation to the use of polypharmacy, that is, more than five drugs. In the urban region of São Paulo, 63.5% of the elderly use polypharmacy, which contrasts with 39.3% in the

rural region of Brejo dos Santos. This fact does not directly imply a considerably different self-assessed health, since in both regions most respondents judged their own health condition similarly, as regular (50.4% in Brejo dos Santos, and 43, 5% in São Paulo) (Table 1).

Elderly individuals with dementia or suggestive cognitive decline were excluded from the bivariate and multivariate analysis. Out of 179 participants from Brejo dos Santos and 238 from São Paulo, 90 and 169 were able to answer the questionnaire, respectively (Table 1). In Brejo dos Santos, 42.2% of the longevous elderly have depressive symptoms; while, in São Paulo, this frequency corresponds to 29% of the population studied. However, 6.8% of the elderly in Paraíba were, at some point in their lives, diagnosed with depression; in contrast to 16.8% in the capital of São Paulo. Thus, data show evidence that the elderly in the metropolitan region have more access to specialized health services, when compared to the population living in the interior of the state of Paraíba.

Table 1. Profile of older elderly people in the Northeast and Southeast regions regarding sociodemographic characteristics, psychosocial factors, and social support network. SABE-SP study, 2015 (N=238) / SABE- PB, 2017 (N=179).

Variables	SABE-PB		SABE-SP	
	n	%	n	%
Gender				
Women	98	54.7	168	70.6
Men	81	45.3	70	29.4
Age group				
90+	38	21.2	65	27.3
80-89	141	78.8	173	72.7
Referred ethnicity				
White	91	54.2	140	61.7
Non-white	77	45.8	87	38.3
Marital status				
No partner	102	57	188	79
With partner	77	43	50	21
Literacy				
Yes	68	38	181	78.7
No	111	62	49	21.3
Income				
≤1 minimum wage	118	67	88	41.9
>1 minimum wage	58	33	122	58.1
Income sufficiency				
No	69	39	90	40
Yes	108	61	135	60
Food insufficiency up to age 15				
Yes	67	41.4	33	14.8
No	95	58.6	190	85.2
Number of chronic diseases				
Two or more	94	52.5	164	73.9
One	64	35.8	42	18.9
None	21	11.7	16	7.2

Pain				
Yes	37	21.3	93	41.9
No	137	78.7	129	58.1
Functional status				
Not walk	20	11.2	29	12.3
Walk	159	88.8	207	87.7
Difficulty in ADLs				
Yes	56	31.5	65	27.4
No	122	68.5	172	72.6
Difficulty in IADLs				
Yes	156	87.2	166	70
No	23	12.8	71	30
Depression diagnosis				
Yes	12	6.8	39	16.8
No	165	93.2	193	83.2
Polypharmacy				
Yes	55	39.3	139	63.5
No	85	60.7	80	36.5
Self-assessed health				
Bad	14	10.7	28	13.1
Regular	5166	50.4	93	43.5
Good		38.9	93	43.5
Subjective Well-being				
Worst well-being	31	23.1	43	21.3
Best well-being	103	76.9	159	78.7
Overall life satisfaction				
Low satisfaction	18	12.9	43	19.2
High satisfaction	122	87.1	181	80.8
Loneliness				
Yes	78	54.9	84	41.2
No	64	45.1	120	58.8
Isolation				
Yes	50	35.7	49	24
No	90	64.3	155	76
Receives support				
No	34	19	73	30.8
Yes	145	81	164	69.2
Gives support				
No	41	22.9	95	40.1
Yes	138	77.1	142	59.9

Co-residence				
No	25	14	62	26.6
Yes	154	86	171	73.4
Family Arrangements				
Alone	25	14	62	26.6
Only spouse	37	20.7	29	12.4
Only children	45	25.1	64	27.5
Children and grandchildren	32	17.9	41	17.6
Other arrangements	40	22.3	37	15.9
Spends most of the time with				
Alone	3	1.9	75	32.5
Elderly people	83	53.2	77	33.3
Adults	63	40.4	67	29
Children and teenagers	7	4.5	12	5.2
Number of members of the social support network				
Alone	25	14	62	26.6
Between 2 and 4	130	72.6	144	61.8
5 or more	24	13.4	27	11.6
Dementia and suggestive of cognitive decline				
Yes	89		69	
No	90		169	
Depressive symptoms				
Yes	38	42.2	49	29
No	52	57.8	120	71

SABE=health, well-being, and aging; ADLs=basic activities of daily living; IADLs=instrumental activities of daily living.

Table 2 shows the results found in the association analysis in relation to the presence of symptoms that suggest depression. The variables “self-assessed health”, “subjective well-being”, “feeling of loneliness” and “feeling of isolation” showed an association with the presence of depressive symptoms in both rural and urban populations. However, the variables "number of chronic diseases", "receives social support from the family", "offers social support", "co-residence" and "number of members of the social support network" were associated with the presence of symptoms suggesting depression only in the population residing in Brejo dos Santos. The variables “literacy”, “difficulty in ADLs”, “difficulty in IADLs”, “diagnosis of depression” and “global satisfaction with life” were found to be associated with depressive symptoms only in the sample of longevous elderly in São Paulo.

The results of the hierarchical multiple logistic regression analysis are shown in Table 3, which highlight the variables that influence the presence of symptoms that suggest depression in longevous elderly. In Brejo dos Santos, having a worse perception of health and feeling socially isolated were factors independently associated with the presence of these symptoms. The living arrangement was also a factor independently associated with the presence of symptoms suggesting depression; however, with negative association. That is, living alone, with children, or with children and grandchildren, makes a difference in relation to the manifestation of symptoms suggesting depression. The elderly aged 80 or more living in São Paulo, having worse subjective well-being, and lower overall life satisfaction, were identified as having risk factors for the presence of symptoms suggesting depression.

Table 2. Bivariate association between socio-economic demographic variables, psychosocial aspects, and support networks on the presence of depressive symptoms, comparing results obtained with long-lived elderly from Brejo dos Santos (PB) (SABE-PB) and São Paulo (SP) (SABE-SP)

	SABE-PB (Brejo dos Santos)					SABE-SP (São Paulo)						
	Depressive Symptoms		OR crude	CI 95%	p	Depressive Symptoms		OR crude	CI 95%	p		
	Yes	No				Yes	No					
	n (%)	n (%)				n (%)	n (%)					
Gender						0.05						0.44
Women	24(26.67)	22(24.44)	2.33	0.99-5.51		36(21.30)	81(47.93)	1.33	0.63-2.79			
Men	14(15.56)	30(33.33)	1.00	1.00		13(7.69)	39(23.08)	1.00	1.00			
Age group						0.88						0.721
90+	4(4.44)	5(5.56)	1.10	0.27-4.42		11(6.51)	24(14.20)	1.158	0.51-2.59			
80-89	34(37.78)	47(52.22)	1.00	1.00		38(22.49)	96(56.80)	1.00	1.00			
Referred ethnicity						0.72						0.11
White	19(22.35)	24(28.24)	1.16	0.49-2.75		27(16.07)	81(48.21)	0.57	0.29-1.13			
Non-white	17(20)	25(29.41)	1.00	1.00		22(13.10)	38(22.62)	1.00	1.00			
Marital status						0.45						0.22
No partner	22(24.44)	26(28.89)	1.37	0.59-3.19		41(24.26)	90(53.25)	1.7	0.72-4.04			
With partner	16(17.78)	26(28.89)	1.00	1.00		8(4.73)	30(17.75)	1.00	1.00			
Literacy						0.65						0.04
No	23(25.56)	29(32.22)	1.21	0.52-2,84		13(7.78)	17(10.18)	2.31	1.02-5.25			
Yes	15(16.67)	23(25.56)	1.00	1.00		34(20.36)	103(61.68)	1.00	1.00			
Income						0.41						0.25
≤ 1 minimum wage	27(30.68)	33(37.5)	1.47	0.58-3.71		18(11.76)	38(24.84)	1.52	0.73-3.16			
> 1 minimum wage	10(11.36)	18(20.45)	1.00	1.00		23(15.03)	74(48.37)	1.00	1.00			
Income sufficiency						0.70						0.36
No	16(17.78)	24(26.67)	0.84	0.36-1.97		21(12.57)	43(25.75)	1.37	0.69-2.71			
Yes	22(24.44)	28(31.11)	1.00	1.00		27(16.17)	76(45.51)	1.00	1.00			

Food insufficiency up to age 15					0.07					0.49
Yes	21(23.33)	19(21.11)	2.14	0.91-5.03	7(4.17)	13(7.74)	1.4	0.52-3.77		
No	17(18.89)	33(36.67)	1.00	1.00	41(24.40)	107(63.69)	1.00	1.00		
Number of chronic diseases					0.002					0.884
Two or more	23(25.56)	18(20)	1.04	(0.31-3.55)	35(21.34)	86(52.44)	1.22	(0.31-4.78)		
One	7(7.78)	28(31.11)	5.33	(1.39-20.45)	10(6.10)	21(12.80)	1.43	(0.32-6.45)		
None	8(8.89)	6(6.67)	1.00	1.00	3(1.83)	9(5.49)	1.00	1.00		
Pain					0.72					0.95
Yes	10(11.11)	12(13.33)	1.19	0.45-3.13	21(12.43)	52(30.77)	0.98	0.50-1.91		
No	28(31.11)	40(44.44)	1.00	1.00	28(16.57)	68(40.24)	1.00	1.00		
Functional status					1*					0.41*
Not walk	1(1.11)	1(1.11)	1.37	0.08-22.75	3(1.78)	4(2.37)	1.89	0.40-8.78		
walk	37(41.11)	51(56.67)	1.00	1.00	46(27.22)	116(68.64)	1.00	1.00		
Difficulty in ADLs					0.73					0.03
Yes	5(5.62)	5(5.62)	1.39	0.37-55.20	12(7.10)	14(8.28)	2.45	1.04-5.78		
No	33(37.08)	46(51.69)	1.00	1.00	37(21.89)	106(62.72)	1.00	1.00		
Difficulty in IADLs					0.39					0.01
Yes	32(35.56)	40(44.44)	1.60	0.54-4.73	38(22.49)	70(41.42)	2.46	1.15-5.29		
No	6(6.67)	12(13.33)	1.00	1.00	11(6.51)	50(29.59)	1.00	1.00		
Depression diagnosis					0.38*					0.01
Yes	1(1.12)	4(4.49)	0.31	0.03-2.96	12(7.19)	12(7.19)	2.97	1.22-7.20		
No	37(41.57)	47(52.81)	1.00	1.00	36(21.56)	107(64.07)	1.00	1.00		
Polypharmacy					0.17					0.36
Yes	16(21.92)	14(19.18)	1.92	0.74-4.97	29(18.83)	66(42.86)	1.41	0.67-2.96		
No	16(21.92)	27(36.99)	1.00	1.00	14(0.09)	45(29.22)	1.00	1.00		
Self-assessed health					<0.001					<0.001
Bad	8(8.99)	2(2.25)	0.06	(0.01-0.35)	13(7.69)	7(4.14)	8.62	(2.91-25.52)		
Regular	23(25.84)	20(22.47)	0.21	(0.08-0.58)	22(13.02)	48(28.40)	2.13	(0.99-4.58)		
Good	7(7.87)	29(32.58)	1.00	1.00	14(8.28)	65(38.46)	1.00	1.00		

Subjective Well-being					0.02				<0.001
Worst well-being	12(14.12)	7(8.24)	3.20	1.11-9.25		23(13.69)	8(4.76)	12.88	5.16-32.12
Best well-being	23(27.06)	43(50.59)	1.00	1.00		25(14.88)	112(66.67)	1.00	1.00
Overall life satisfaction					0.21				<0.001
Low satisfaction	7(7.95)	5(5.68)	2.14	0.62-7.39		19(11.24)	9(5.33)	7.81	3.20-19.01
High satisfaction	30(34.09)	46(52.27)	1.00	1.00		30(17.75)	111(65.68)	1.00	1.00
Loneliness					0.04				0.001
Yes	26(30.23)	24(27.91)	2.46	1.001-6.05		29(17.37)	40(23.95)	3.01	1.50-6.02
No	11(12.79)	25(29.07)	1.00	1.00		19(17.38)	79(47.31)	1.00	1.0
Isolation					0.001				<0.001
Yes	22(25.88)	13(15.29)	4.35	1.73-10.94		20(11.98)	19(11.38)	3.75	1.76-7.99
No	14(16.47)	36(41.35)	1.00	1.00		28(16.77)	100(59.88)	1.00	1.00
Receives support					0.004				0.21
No	14(15.56)	6(6.67)	4.47	1.52-13.11		12(7.10)	41(24.26)	0.62	0.29-1.32
Yes	24(26.67)	46(51.11)	1.00	1.00		37(21.89)	79(46.75)	1.00	1.00
Gives support					0.03				0.71
No	13(14.44)	8(8.89)	2.86	1.04-7.83		19(11.24)	43(25.44)	1.13	0.57-2.25
Yes	25(27.78)	44(48.89)	1.00	1.00		30(17.75)	77(45.56)	1.00	1.00
Co- residence					0.01				0.41
No	11(12.22)	5(5.56)	3.83	1.20-12.19		12(7.23)	36(21.69)	0.73	0.34-1.56
Yes	27(30)	47(52.22)	1.00	1.00		37(22.29)	81(48.80)	1.00	1.00
Family Arrangements					0.052				0.531
Alone	11(12.22)	5(5.56)	0.12	(0.03-0.56)		12(7.23)	36(21.69)	1.00	(0.3225-3.1006)
Only spouse	8(8.89)	13(14.44)	0.43	(0.11-1.78)		5(3.01)	18(10.84)	0.83	(0.22-3.23)
Only children	8(8.89)	13(14.44)	0.43	(0.11-1.78)		17(10.24)	28(16.87)	1.82	(0.6-5.49)
Children and grandchildren	7(7.78)	6(6.67)	0.23	(0.05-1.08)		9(5.42)	17(10.24)	1.59	(0.47-5.42)
Other arrangements	4(4.44)	15(16.67)	1.00	1.00		6(3.61)	18(10.84)	1.00	1.00

Spends most of the time with		0.29*			0.15*			
Alone	2(2.67)	0(0)			15(9.09)	43(26.06)		
Elderly people	14(18.67)	24(32)			12(7.27)	42(25.45)		
Adults	10(13.33)	21(28)			17(10.30)	25(15.15)		
Children and teenagers	2(2.67)	2(2.67)	1.00	1.00	5(3.03)	63.64	1.00	1.00
Number of members of the social support network		0.017			0.243			
Alone	11(12.22)	5(5.56)	0.76	(0.13-4.49)	12(7.23)	36(21.69)	0.38	(0.12-1.19)
Between 2 and 4	22(24.44)	44(48.89)	3.33	(0.73-15.24)	29(17.47)	72(43.37)	0.45	(0.16-1.29)
5 or more	5(5.56)	3(3.33)	1.00	1.00	8(4.82)	9(5.42)	1.00	1.00

SABE=health, well-being, and aging; ADLs=basic activities of daily living; IADLs=instrumental activities of daily living.

Table 3. Multiple logistic regression model for the association between socioeconomic demographic variables, psychosocial aspects, and support networks on the presence of depressive symptoms in long-lived elderly people living in Brejo dos Santos (SABE-PB) and São Paulo (SABE-SP)

Variables	Depressive symptoms			
	SABE-PB ORadj (CI 95%)	p-value	SABE-SP ORadj (CI 95%)	p-value
Pain		0.153		-
Yes	0.35(0.08-1.51)		-	
No	1.00		-	
Difficulty in ADLs		0.304		-
Yes	2.96(0.36-24.18)		-	
No	1.00		-	
Depression diagnosis		-		0.207
Yes	-		2.2(0.66-7.37)	
No	-		1.00	
Polypharmacy		0.483		-
Yes	0.66(0.2-2.14)		-	
No	1.00		-	

Self-assessed health		0.004		-
Bad	0.06(0.01-0.58)			-
Regular	0.11(0.02-0.56)			-
Good	1.00			-
Subjective Well-being		-		< 0.001
Worst well-being	-		11.12(3.69-33.4)	
Best well-being	-		1.00	
Overall life satisfaction		0.493		0.001
Low satisfaction	1.53(0.45-5.17)		6.28(2.02-19.57)	
High satisfaction	1.00		1.00	
Loneliness		-		0.403
Yes	-		1.63(0.52-5.09)	
No	-		1.00	
Isolation		0.003		0.609
Yes	6.06(1.68-21.89)		1.38(0.4-4.76)	
No	1.00		1.00	
Family Arrangements		0.02		0.513
Alone	0.06(0.01-0.43)		1.89(0.34-10.41)	
Only spouse	0.22(0.04-1.32)		1.74(0.31-9.72)	
Only children	0.08(0.01-0.66)		1.35(0.31-5.89)	
Children and grandchildren	0.09(0.01-0.8)		0.44(0.08-2.43)	
Other arrangements	1.00		1.00	
Spends most of the time with		-		0.096
Alone	-		0.39(0.11-1.44)	
Elderly people	-		0.53(0.15-1.86)	
Children and teenagers	-		3.78(0.64-22.32)	
Adults	-		1.00	

SABE=health, well-being, and aging; ADLs=basic activities of daily living.

3. Discussion

In this research, a higher prevalence of symptoms that suggest depression was observed among the elderly in Brejo dos Santos than in São Paulo. Depression is a multifactorial disorder with moderate heritability, and there are some genetic variants that increase the risk of its manifestation. Because this community has had a tradition of consanguineous marriages for several generations (Weller et al., 2012), it is possible that there are shared alleles in this community that could explain the increase in cases of people with this condition; however, the alternative hypothesis concerning the lack of access to specialized services by populations living further away from urban centers should also be considered. It was observed that only in the population of São Paulo there was an association between having symptoms suggesting depression and having been diagnosed with depression, which shows less access to diagnosis and treatment of psychiatric disorders in rural populations.

In this study, an association was found between loneliness and isolation with the presence of depressive symptoms in the elderly in both locations, which corroborates the data found in previous studies (Cacioppo, Hawkley, & Thisted, 2010; Hawkley & Cacioppo, 2010; Park, Jang, Lee, & Chiriboga, 2015; Sakurai et al., 2019). The findings of this study also showed that the presence of symptoms that suggest depression in Brejo dos Santos is related to the absence of a social support network and the fact that the seniors live alone. In rural and consanguineous communities, such as in Brejo dos Santos, interaction with family members and neighbors is more frequent and more valued than in urban centers, where most long-lived people live alone. This relationship observed in this study between community interaction and interpersonal relationships with mental health corroborates the findings of the Harvard Study on Adult Development (Mitchell, 2004). Elderly people that are more socially connected to family, friends, and the community are happier, physically healthier, and live longer than people who are socially disconnected (Mitchell, 2004).

In São Paulo, an association was found between difficulty in performing basic activities of daily living and difficulty in instrumental activities of daily living with the presence of symptoms suggesting depression. These data are in line with the Kurabuchi Study, carried out with elderly people in the city of Kurabuchi, Japan, in which an association was observed between depressive symptoms and difficulty in daily activities of life (Nakamura, Michikawa, Imamura, Takebayashi, & Nishiwaki, 2017); this also corroborates the results found in a cross-sectional study carried out in the United States, in which the elderly who had more depressive symptoms were more likely to report difficulty in basic and instrumental activities of daily living (Song, Meade, Akobundu, & Sahyoun, 2014).

Subjective well-being and self-assessed health were also associated with depressive symptoms in both populations; corroborating previous studies (Hellwig, Munhoz & Tomasi, 2016; Lee, Choi, & Lee, 2020, Simões et al., 2021). The long-lived seniors in Northeast Brazil have lived with poverty, having suffered food restrictions in childhood. Overcoming these difficulties may have contributed to better acceptance of current health conditions, awakening an overall sense of positive happiness and subjective well-being (Simões et al., 2021). Among urban elderly people in São Paulo, an association was found between symptoms that suggest depression and having worse overall life satisfaction. This worse satisfaction with life is also related to the number of chronic diseases, which in both populations was also associated with depressive symptoms, and also corroborates literature findings (Lotfaliany et al., 2018; Moussavi et al., 2007; Meule & Voderholzer, 2020). In São Paulo, elderly people with depression symptoms had a lower educational level, corroborating literature data (Lotfaliany et al., 2018; Nakamura et al., 2017; Song et al., 2014). This association was not found in Brejo dos Santos, possibly because in this region, the elderly are predominantly illiterate and poor.

The limitations of this work relate to the use of self-reported data and a cross-sectional study. The causality of the depressive symptoms cannot be determined with this study design. The findings of this study point to the need to investigate, in greater depth, the issue of psychiatric disorders in elderly people from regions farther away from urban centers, whose access to specialized health services is scarcer.

5. Conclusion

The findings of this study point to important regional differences in relation to the prevalence of symptoms suggesting depression and factors associated with this condition among elderly people aged 80 years and over who live in rural and urban regions in Brazil; indicating that public policies and actions of health care services should consider these regional differences. In the rural region of Brejo dos Santos, these symptoms were more associated with the family support network, co-residence, and number of members of the social network; on the other hand, in São Paulo, depression is more associated with the elderly person's dependency for performing basic and instrumental activities of daily living and with their overall satisfaction with life.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

References

- Almeida, O. P., & Almeida, S. A. (1999). Reliability of the Brazilian version of the geriatric depression scale (GDS) short form. *Arquivos de Neuro-psiquiatria*, 57, 421-426. <https://doi.org/10.1590/S0004-282X1999000300013>
- Andrade, F. C. D., Wu, F., Lebrão, M. L., & Duarte, Y. A. D. O. (2016). Life expectancy without depression increases among Brazilian older adults. *Revista de Saude Publica*, 50, 12. <https://doi.org/10.1590/S1518-8787.2016050005900>
- Cacioppo, J. T., Hawkley, L. C., & Thisted, R. A. (2010). Perceived social isolation makes me sad: 5-year cross-lagged analyses of loneliness and depressive symptomatology in the Chicago Health, Aging, and Social Relations Study. *Psychology and Aging*, 25(2), 453. <https://doi.org/10.1037/a0017216>
- Dalgalarondo, P. (2019). *Psicopatologia e semiologia dos transtornos mentais* (3rd ed.). Porto Alegre, RS: Artmed. Portuguese.
- Figueiredo, T., Melo, U. S., Pessoa, A. L. S., Nobrega, P. R., Kitajima, J. P., Correa, I., ... Santos, S. (2015). Homozygous missense mutation in MED25 segregates with syndromic intellectual disability in a large consanguineous family. *Journal of Medical Genetics*, 52(2), 123-127. <http://dx.doi.org/10.1136/jmedgenet-2014-102793>
- Icaza, M. G., & Albala, C. (1999). Minimal State Examinations (MMSE) del estudio de demencia en Chile: análisis estadístico. In *Minimal State Examinations (MMSE) del estudio de demencia en Chile: análisis estadístico* (pp. 18-18).
- Golja, K., Daugherty, A. M., & Kavcic, V. Cognitive reserve and depression predict subjective reports of successful aging. *Arch Gerontol Geriatr*. 2020; 90:104137. <https://doi.org/10.1016/j.archger.2020.104137>
- Hawkley, L. C., & Cacioppo, J. T. (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of Behavioral Medicine*, 40(2), 218-227. <https://doi.org/10.1007/s12160-010-9210-8>
- Hellwig, N., Munhoz, T. N., & Tomasi, E. (2016). Depressive symptoms among the elderly: a cross-sectional population-based study. *Ciência & Saúde Coletiva*, 21, 3575-3584. <https://doi.org/10.1590/1413-812320152111.19552015>
- Brazilian Institute of Geography and Statistics [IBGE] (2010). 2010 census data. Available from: <https://censo2010.ibge.gov.br/>.
- Lee, S. W., Choi, J. S., & Lee, M. (2020). Life Satisfaction and Depression in the Oldest Old: A Longitudinal Study. *The International Journal of Aging and Human Development*, 91(1), 37-59. <https://doi.org/10.1177/0091415019843448>
- Lebrão, M. L., & Duarte, Y. A. O. (2008). Desafios de um estudo longitudinal: o Projeto SABE. *Saúde Coletiva*, 5(24), 166-167.
- Lebrão, M. L., & Duarte, Y. A. O. (2003). SABE-saúde, bem-estar e envelhecimento, o Projeto Sabe no município de São Paulo: uma abordagem inicial. Brasília, DF: Organização Pan-Americana da Saúde.
- Lebrão, M. L., Duarte, Y. A. O., Santos, J. L. F., & Laurenti, R. (2008). Evolução nas condições de vida e saúde da população idosa do Município de São Paulo. *São Paulo em Perspectiva*, 22(2), 30-45.
- Lebrão, M. L., & Laurenti, R. (2005). Health, Well-Being and aging: the SABE Study in São Paulo, Brazil. *Revista Brasileira de Epidemiologia*, 8, 127-141.
- Liberalesso, T. E. M., Dallazen, F., Bandeira, V. A. C., & Berlezi, E. M. (2017). Prevalence of frailty in a long-lived population in the Southern region of Brazil. *Saúde em Debate*, 41, 553-562. <https://doi.org/10.1590/0103-1104201711316>
- Lotfaliany, M., Bowe, S. J., Kowal, P., Orellana, L., Berk, M., & Mohebbs, M. (2018). Depression and chronic diseases: Co-occurrence and communality of risk factors. *Journal of Affective Disorders*, 241, 461-468. <https://doi.org/10.1016/j.jad.2018.08.011>
- Maia, F. O. M. (2005). *Fatores de risco para óbitos em idosos* (Master's thesis). Available from <http://www.fsp.usp.br/sabe>.

- Meule, A., & Voderholzer, U. (2020). Life satisfaction in persons with mental disorders. *Quality of Life Research*, 29(11), 3043-3052. <https://doi.org/10.1007/s11136-020-02556-9>
- Meeks, T. W., Vahia, I. V., Lavretsky, H., Kulkarni, G., & Jeste, D. V. (2011). A tune in “a minor” can “b major”: a review of epidemiology, illness course, and public health implications of subthreshold depression in older adults. *Journal of Affective Disorders*, 129(1-3), 126-142. <https://doi.org/10.1016/j.jad.2010.09.015>
- Mitchell, J. F. (2004). Aging Well: Surprising Guideposts to a Happier Life from the Landmark Harvard Study of Adult Development. *American Journal of Psychiatry*, 161(1), 178-179. <https://doi.org/10.1176/appi.ajp.161.1.178>
- Moussavi, S., Chatterji, S., Verdes, E., Tandon, A., Patel, V., & Ustun, B. (2007). Depression, chronic diseases, and decrements in health: results from the World Health Surveys. *The Lancet*, 370(9590), 851-858. [https://doi.org/10.1016/S0140-6736\(07\)61415-9](https://doi.org/10.1016/S0140-6736(07)61415-9)
- Nakamura, T., Michikawa, T., Imamura, H., Takebayashi, T., & Nishiwaki, Y. (2017). Relationship between depressive symptoms and activity of daily living dependence in older Japanese: The Kurabuchi study. *Journal of the American Geriatrics Society*, 65(12), 2639-2645. <https://doi.org/10.1111/jgs.15107>
- Park, N. S., Jang, Y., Lee, B. S., & Chiriboga, D. A. (2015). The relation between living alone and depressive symptoms in older Korean Americans: do feelings of loneliness mediate? *Aging & Mental Health*, 21(3), 304-312. <https://doi.org/10.1080/13607863.2015.1099035>
- Sakurai, R., Kawai, H., Suzuki, H., Kim, H., Watanabe, Y., Hirano, H., ... Fujiwara, Y. (2019). Poor social network, not living alone, is associated with incidence of adverse health outcomes in older adults. *Journal of the American Medical Directors Association*, 20(11), 1438-1443. <https://doi.org/10.1016/j.jamda.2019.02.021>
- Simões, R. F., Nóbrega, J. C., Barbosa, J., Santos, T., Olinda, R. A., Menezes, T. N., ... Santos, S. (2021). Happiness, Subjective Well-Being, and Life Satisfaction: A Compared Study between Long-Lived Elderly People in Northeast and Southeast Brazil. *Global Journal of Health Science*, 13(1), 1-89. <https://doi.org/10.5539/gjhs.v13n1p89>
- Schoevers, R. A., Geerlings, M. I., Beekman, A. T., Penninx, B. W. J. H., Deeg, D. J., Jonker, C., & Van Tilburg, W. (2000). Association of depression and gender with mortality in old age: results from the Amsterdam Study of the Elderly (AMSTEL). *The British Journal of Psychiatry*, 177(4), 336-342. <https://doi.org/10.1192/bjp.177.4.336>
- Song, H. J., Meade, K., Akobundu, U., & Sahyoun, N. R. (2014). Depression as a correlate of functional status of community-dwelling older adults: utilizing a short-version of 5-item Geriatric Depression Scale as a screening tool. *The Journal of Nutrition, Health & Aging*, 18(8), 765-770. <https://doi.org/10.1007/s12603-014-0542-0>
- Vilalta-Franch, J., Planas-Pujol, X., López-Pousa, S., Llinàs-Reglà, J., Merino-Aguado, J., & Garre-Olmo, J. (2012). Depression subtypes and 5-years risk of mortality in aged 70 years: a population-based cohort study. *International Journal of Geriatric Psychiatry*, 27(1), 67-75. <https://doi.org/10.1002/gps.2691>
- United Nations. (2020). *Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat*. New York, NY: United Nations.
- Wancata, J., Alexandrowicz, R., Marquart, B., Weiss, M., & Friedrich, F. (2006). The criterion validity of the Geriatric Depression Scale: a systematic review. *Acta Psychiatrica Scandinavica*, 114(6), 398-410. <https://doi.org/10.1111/j.1600-0447.2006.00888.x>
- Weller, M., Tanieri, M., Pereira, J. C., Almeida, E. D. S., Kok, F., & Santos, S. (2012). Consanguineous unions and the burden of disability: A population-based study in communities of Northeastern Brazil. *American Journal of Human Biology*, 24(6), 835-840. <https://doi.org/10.1002/ajhb.22328>
- Willig, M. H., Lenardt, M. H., & Caldas, C. P. (2015). A longevidade segundo histórias de vida de idosos longevos. *Revista Brasileira de Enfermagem*, 68, 697-704. <https://doi.org/10.1590/0034-7167.2015680418i>

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).