

## ARTICLE ORIGINAL



## Prevalence of depressive symptoms among young adults in Brazil: Results of the 2013 and 2019 editions of the National Health Survey

### Prevalência de sintomas depressivos entre adultos jovens no Brasil: resultados da Pesquisa Nacional de Saúde 2013 e 2019

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## ABSTRACT

**Objective:** To estimate the prevalence of depressive symptoms in the population aged 18 to 24, according to socioeconomic and demographic aspects in Brazil, comparing its evolution between 2013 and 2019. **Methods:** Cross-sectional study carried out with secondary data obtained from National Health Survey 2013 and 2019. It were included 7,823 young adulthood (aged 18 to 24) from 2013 and 8,047 from 2019. The instrument used to assess depression was the Patient Health Questionnaire-9 (PHQ-9). All estimates included population weights and complex sampling. **Results:** The prevalence of depression almost doubled: 10.9% (95%CI 9.6–12.2) in 2019, compared to 5.6% (95%CI 4.8–6.4) in 2013, an absolute difference of 5.3% (4.5–6.0) greater. Women were the most affected in both surveys, with an increase between 2013 (8.3%; 95%CI 6.9–9.6) and 2019 (15.6%; 95%CI 13.5–17.6) higher than that of men (2013: 2.9%; 95%CI 2.0–3.8 and 2019: 6.2%; 95%CI 4.7–7.7). In both sexes, the pattern of increase was greater for the groups aged 18 to 20, not participating in religious activities, who were at the lowest levels of education and income, who lived with two or three or more people, who lived in the Northeast, Southeast, capitals and metropolitan areas of the country. **Conclusion:** There was a significant increase in the prevalence of depressive symptoms over the six years between the two surveys. However, this increase did not occur homogeneously among the characteristics analyzed, indicating population groups and locations in Brazil where the presence of these symptoms increased most in the period.

**Keywords:** Health surveys. Mental health. Depression. Cost of illness. Young adult.

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## INTRODUCTION

Promoting mental health and well-being is a global challenge and a focus of the current Sustainable Development Goals agenda as part of a healthy lifestyle<sup>1</sup>. However, in recent years, young people have been experiencing increasing rates of mental health problems that compromise their health, making this a global public health problem<sup>2</sup>. These problems can occur over a short period of time or manifest themselves in a chronic, progressive and severely disabling manner<sup>3</sup>.

Mental health conditions and their psychosocial consequences are among the main causes of health problems in this century<sup>4,5</sup>. Depression and anxiety are the most disabling mental illnesses in people aged 15 to 54, and these can also increase the risk of other mental disorders or even suicide<sup>4,6</sup>.

Studies conducted in the last decade have shown changes in the patterns of physical and mental illness in different population groups, with a tendency for the prevalence of depression to increase<sup>3,7-10</sup>. Multiple risk and protective factors interact in complex and dynamic ways across the course of life, shaping the prevalence, distribution, and management of depression. The product of these interactions defines the social groups most affected: adolescents, people in early adulthood, women, racial minorities, and those with socioeconomic, community, and social support network deprivation<sup>3,7-9,11,12</sup>.

In different countries, epidemiological surveys are implemented to screen for mental health conditions<sup>3,5,7,13-20</sup>. Their results guide measures and public policies for the early management of symptoms of mental problems and their psychosocial consequences<sup>3,6,8,12,15,19-21</sup>. However, in Brazil, mental health data representative of the Brazilian population are still rarely used to identify the prevalence of depression among young people in the country<sup>22</sup>.

Currently, data on the prevalence of mental disorders and use of mental health services among young people are scarce. Studies with adults generally include young people aged 18 to 24, but specific data for this age group are usually grouped under a general "adult" umbrella that covers a broad spectrum of ages. Meanwhile, most studies with children and adolescents do not include patients over 18 years of age. Existing data point to an existing gap in the epidemiological analysis of mental health between late adolescence and early youth<sup>10</sup>.

On the other hand, population-based surveys conducted in Brazil, such as the National Health Survey (PNS) 2013 and 2019, applied the Patient Health Questionnaire-9 (PHQ-9). This is an internationally accepted and valid questionnaire for identifying depression outcomes<sup>10</sup>. The PHQ-9 data in the PNS are an important alternative for still open analyses on the occurrence of depressive symptoms in the population aged 18 to 24. Therefore, the existence of data in two years (2013 and 2019) allows us to understand over

time the changes in the prevalence of depressive symptoms and their distribution in the young adult population of the country.

Thus, this study estimated the prevalence of depressive symptoms among young adults aged 18 to 24, according to socioeconomic and demographic aspects of Brazil, comparing its evolution between the years 2013 and 2019.

## METHODS

### Type of study

Cross-sectional study based on secondary data collected by the National Health Survey (PNS) carried out in 2013 and 2019.

### National Health Survey

The National Health Survey (PNS) was conducted in 2013 and 2019 by the Brazilian Institute of Geography and Statistics (IBGE) in partnership with the Ministry of Health and the Oswaldo Cruz Foundation (Fiocruz)<sup>23,24</sup>. It is a population-based household survey with nationwide coverage that sought to obtain valid and representative information from the Brazilian population on a set of life and health indicators. The target population of the 2013 PNS was individuals aged 18 years or older, and in 2019, individuals aged 15 years or older living in permanent private households in Brazil. The survey questionnaires contain questions about the households and all their residents. A third part of the questions is intended to record other health information for a resident  $\geq 18$  years of age in 2013 and  $\geq 15$  years of age in 2019, randomly selected from among all residents of the previously selected household<sup>23,24</sup>.

The PNS uses a complex probability sample of selected area units (census sectors) from all federative units/states in Brazil. The sampling was probabilistic by clusters in three stages of selection, with stratification by the selected areas. Households represent the secondary units, and the tertiary unit represents the resident ( $\geq 18$  years old in 2013 and  $\geq 15$  years old in 2019) selected from each household from the list of residents, who responds to the individual part of the questionnaire administered by the PNS. The census sectors or set of sectors were initially selected by probability proportional to size and by probability equally proportional to the PNS. Households and residents were selected by simple random sampling<sup>23,24</sup>. Further methodological details can be obtained in PNS publications<sup>23,24</sup>.

### Study population and variables

This analysis considered only individuals aged 18 to 24 in 2013 ( $n=7,823$ ) and 2019 ( $n=8,047$ ) who were interviewed as residents selected in both PNS and who self-reported information regarding the questionnaire modules intended for them. The age group of 18 to 24 years was selected in view of the recent recognition of the unique health care needs of

this population. Known as young adults or emerging adults, they are at greater risk of specific health problems (mental illnesses, substance use, sexually transmitted infections and health risk behaviors)<sup>25</sup>. The age group of 18 to 24 years is adopted in various epidemiological studies<sup>25,26</sup>.

A set of socioeconomic, demographic and depression symptom variables were used in the analyses. Among the socioeconomic and demographic variables: sex (male, female); age (in age groups: 18 to 20, 21 to 24 years); color/race (white, black — mixed race or black —, other); number of residents in the household (1, 2 and  $\geq 3$ ); participates in religious activities (yes, no); works (yes, no); education (in levels, up to incomplete elementary school; complete elementary school to incomplete high school; complete high school to incomplete higher education; and complete higher education); macro-region of residence in the country (North, Northeast, Central-West, Southeast and South); type of city within the state (capital and metropolitan region, countryside); and per capita income quintile (no income up to 1/2 minimum wage (MW), more than 1/2 to 1 MW, more than 1 to 2 MW, more than 2 to 3 MW, more than 3 MW). In 2013, the median income at the lowest level was R\$217 and at the highest, R\$3,000. In 2019, the median income at the lowest level was R\$290 reais and at the highest, R\$4,100.

In the PNS, symptoms of depression were investigated using the PHQ-9. This instrument tracks the presence of these symptoms taking as reference the last two weeks before the date of the PNS interview. The PHQ-9 has been validated in Brazil<sup>27</sup>, and analyses have already been published using PNS data in other age groups<sup>10</sup>. In this study, the presence of depressive symptoms was defined as a PHQ-9 score greater than or equal to 10, which is considered the best cutoff point for detecting the presence of clinically relevant symptoms<sup>10,28,29</sup>.

### Analysis

For both years of the PNS, the prevalence and their 95% confidence intervals (95%CI) of the socioeconomic and demographic variables were determined. Differences in the frequency distribution of the variables were assessed according to the year and considered statistically significant at the 5% level in the absence of overlapping 95%CI. Pearson's  $\chi^2$  test was used to confirm differences between the PNS.

The prevalence of depression symptoms was described according to the socioeconomic and demographic variables. The prevalence and respective 95%CI were determined for each year of the PNS. The change in prevalence between the two years was presented through the absolute difference that estimated the magnitude and variation in the period. The data from the two surveys were aggregated into a single database. Pearson's  $\chi^2$  test was used to confirm differences between the PNS. Using the weight of the resident selected with calibration, the absolute changes

from 2013 to 2019 were calculated in relation to the presence of depressive symptoms. The analysis was stratified by sex, as men and women have different demands, roles and social pressures throughout their lives<sup>1,8</sup>. Studies suggest this type of analysis<sup>1,8</sup>.

The analyses were performed using RStudio software version 2022.12.0.353 (R Foundation for Statistical Computing, Boston, USA) and incorporate all the characteristics of the complex sampling plan of the 2013 and 2019 PNS.

### Ethical aspects

The 2013 and 2019 PNS projects were approved by the National Research Ethics Committee (CONEP)/National Health Council (CNS), and all participants signed an informed consent form<sup>23,24</sup>.

## RESULTS

Data from 7,823 young adults in 2013 and 8,047 in 2019 were analyzed, representing an expanded population of 19,302,635 people in 2013 and 24,593,655 in 2019. During the period, there was no difference in the median age (2013: 21, 19–23; and 2019: 21, 20–23). There was a statistically significant decrease in the proportion of young people interviewed as residents selected among the PNS ( $p < 0.001$ ) (Table 1). In both years, the proportions of young people aged 21 to 24 were higher. There was a statistically significant decrease in the proportion of white people, but there was an increase in the proportion of black young people, without participating in religious activities, in the stratum of complete secondary education to incomplete higher education, and with a lower level of per capita household income.

Table 2 shows the prevalence of depressive symptoms according to socioeconomic and demographic characteristics of young adults aged 18 to 24 in the 2013 and 2019 PNS. During the period, this prevalence almost doubled, rising from 5.6% (95%CI 4.8–6.4) in 2013 to 10.9% (95%CI 9.6–12.2) in 2019, with the absolute change between years being statistically significant (5.3%; 95%CI 4.5–6.0;  $p = 0.001$ ). In almost all variables, the absolute change in the prevalence of depressive symptoms between years showed a statistically significant increase ( $p < 0.05$ ). This increase was greater among younger individuals (18 to 20 years old); in all races (except other); with two, or three, or more residents in the household; who did not participate in religious activities; residents in the Southeast and Northeast regions; and in all types of cities in the country. On the other hand, there remained no statistically significant changes at the extremes of education and at the highest income level ( $p > 0.05$ ). Both sexes showed a statistically significant increase in the prevalence of depressive symptoms. However, women had the highest prevalence in both surveys (2013: 8.3%; 95%CI 6.9–9.6 and 2019: 15.6%; 95%CI 13.5–17.6) and among them (7.3%; 6.1–8.5;  $p < 0.001$ ).

**Table 1. Characterization of Brazilian young adults interviewed in the National Health Survey (PNS) 2013 and 2019, Brazil.**

Variables	2013 (n=7,823)		2019 (n=8,047)		p-value*
	Total		Total		
	%	95%CI	%	95%CI	
Total (18 to 24 in PNS)	15.9	15.4; 16.5	13.1	12.6; 13.6	0.001
Sex					
Male	49.3	47.2; 51.5	50.0	48.0; 52.0	0.65
Female	50.7	48.5; 52.8	50.0	48.0; 52.0	
Age group (in years)					
18 to 20	44.5	42.5; 46.5	41.4	39.5; 43.5	0.03
21 to 24	55.5	53.5; 57.5	58.6	56.6; 60.5	
Color/race					
White	43.4	41.4; 45.3	37.8	35.7; 39.9	0.002
Black	55.3	53.3; 57.3	60.9	58.7; 63.0	
Other	1.3	0.9; 1.7	1.3	0.7; 1.7	
Residents in household					
One	2.0	1.7; 2.2	2.3	1.9; 2.6	0.40
Two	14.3	13.3; 15.4	13.8	12.7; 14.9	
Three or more	83.7	82.6; 84.8	83.9	82.8; 85.0	
Religious activities					
Yes	42.5	40.3; 44.6	39.1	37.2; 41.0	0.02
No	57.5	55.4; 59.0	60.9	59.7; 62.8	
Works					
Yes	56.2	54.3; 58.2	54.3	52.3; 56.3	0.17
No	43.8	41.8; 45.7	45.7	43.7; 47.7	
Education					
Incomplete elementary school	16.6	15.1; 18.1	11.3	10.2; 12.4	0.001
Complete elementary school to incomplete high school	27.0	25.3; 28.7	23.8	22.2; 25.4	
Complete high school to incomplete higher education	50.8	48.7; 52.8	59.2	57.3; 61.1	
Complete higher education	5.6	4.6; 6.7	5.7	4.8; 6.5	
Per capita household income (MW)					
No income up to ½	26.0	24.3; 27.6	31.0	29.3; 32.8	0.001
More than 1/2 up to 1	30.1	28.2; 32.0	32.5	30.6; 34.3	
More than 1 up to 2	29.1	27.2; 31.0	24.2	22.4; 26.1	
More than 2 up to 3	7.3	6.3; 8.4	5.9	4.9; 6.8	
More than 3	7.5	6.4; 8.7	6.4	5.3; 7.5	
Macroregion of country					
North	9.3	8.3; 10.3	9.9	9.1; 10.7	0.94
Northeast	28.7	26.6; 30.9	28.4	26.8; 30.0	
Central-West	7.7	6.9; 8.4	7.9	6.9; 8.9	
Southeast	40.5	38.1; 43.0	40.5	38.2; 42.8	
South	13.8	12.2; 15.4	13.3	12.1; 14.4	
Type of city					
Capital and metropolitan region	41.2	39.0; 43.3	42.6	40.5; 44.6	0.44
Countryside	58.8	56.7; 61.0	57.4	55.4; 59.4	

\*Pearson  $\chi^2$  test. 95%CI: 95% confidence interval; MW: minimum wage.

There was a distinct pattern of growth in the prevalence of depressive symptoms between the sexes according to socioeconomic and demographic characteristics. In general, the prevalence and absolute differences were even

higher in women than in men. In men, the change between the years was statistically significant ( $p < 0.05$ ) and greater among younger individuals (18 to 20 years old), white and black individuals, those who lived with two or more people,

**Table 2. Prevalence of depressive symptoms according to socioeconomic and demographic characteristics in Brazilian young adults (18 to 24 years old) interviewed in the National Health Survey 2013 (n=7,823) and 2019 (n=8,047), Brazil.**

Variables	Prevalence of depressive symptoms				Absolute change in prevalence 2013-2019		p-value*
	2013		2019		%	95%CI	
	%	95%CI	%	95%CI			
Depression	5.6	4.8; 6.4	10.9	9.6; 12.2	5.3	4.5; 6.0	0.001
Sex							
Male	2.9	2.0; 3.8	6.2	4.7; 7.7	3.3	2.5; 4.1	0.001
Female	8.3	6.9; 9.6	15.6	13.5; 17.6	7.3	6.1; 8.5	0.001
Age group (in years)							
18 to 20	4.6	3.6; 5.3	12.4	10.0; 14.8	7.8	6.6; 8.9	0.001
21 to 24	6.4	5.7; 7.6	9.8	8.3; 11.3	3.4	2.4; 4.4	0.001
Color/race							
White	4.9	3.7; 6.2	10.9	8.8; 13.0	6.0	4.8; 7.1	0.001
Black	6.1	5.0; 7.2	10.8	9.1; 12.4	4.7	2.7; 6.8	0.001
Other	8.2	1.1; 15.3	16.7	-3.7; 37.1	8.5	0.0; 16.8	0.36
Residents in household							
One	5.4	2.6; 8.2	11.7	6.7; 16.8	6.3	1.2; 12.0	0.02
Two	5.4	3.9; 7.0	12.0	9.1; 14.9	6.6	4.5; 7.8	0.001
Three or more	5.7	4.8; 6.6	10.7	9.2; 12.2	5.0	4.2; 5.8	0.001
Religious activities							
Yes	6.8	5.8; 8.1	10.8	8.5; 13.1	4.0	2.9; 5.2	0.001
No	4.8	3.8; 5.4	10.9	9.3; 12.6	6.1	5.3; 7.1	0.001
Works							
Yes	5.3	4.2; 6.4	9.8	8.0; 11.7	4.5	2.4; 6.9	0.001
No	6.0	4.8; 7.2	12.1	10.2; 14.0	6.1	3.9; 8.7	
Education							
Incomplete elementary school	7.8	5.8; 9.7	11.8	7.8; 15.8	4.0	0.2; 6.2	0.05
Complete elementary school to incomplete high school	4.9	3.6; 6.3	12.6	9.8; 15.4	7.7	6.3; 9.2	0.001
Complete high school to incomplete higher education	5.2	4.1; 6.3	10.5	8.8; 12.3	5.3	4.3; 6.4	0.001
Complete higher education	6.3	1.9; 10.6	5.7	3.3; 8.1	-0.6	-0.3; 0.2	0.81
Per capita household income (MW)							
No income up to 1/2	6.8	5.1; 8.4	11.3	8.9; 13.6	4.5	3.0; 6.0	0.003
More than 1/2 up to 1	5.6	4.2; 6.9	11.9	9.5; 14.3	6.3	5.0; 7.7	0.001
More than 1 up to 2	5.3	3.8; 6.7	10.7	8.0; 13.3	5.4	4.0; 6.8	0.001
More than 2 up to 3	3.3	1.4; 5.2	10.5	4.0; 16.9	7.2	4.6; 9.9	0.006
More than 3	5.5	2.2; 8.8	5.5	2.9; 8.0	0.0	-2.3; 2.4	0.99
Macroregion of country							
North	6.2	4.4; 7.9	8.5	6.6; 10.4	2.3	0.0; 4.7	0.09
Northeast	5.0	3.8; 6.2	10.5	8.7; 12.3	5.5	4.2; 6.9	0.001
Central-West	7.4	5.1; 9.7	10.7	7.4; 13.9	3.3	0.1; 6.2	0.09
Southeast	5.4	4.0; 6.9	12.5	9.7; 15.2	7.1	5.8; 8.3	0.001
South	6.0	3.4; 8.6	8.8	6.4; 11.1	2.8	0.1; 4.6	0.14
Type of city							
Capital and metropolitan region	6.0	5.0; 7.0	12.3	10.5; 14.1	6.3	4.3; 8.8	0.001
Countryside	5.4	4.2; 6.6	9.8	8.0; 11.7	4.5	3.5; 5.4	0.001

\*Pearson  $\chi^2$  test. 95%CI: 95% confidence interval; MW: minimum wage.

those who did not participate in religious activities, those living in the Southeast and Northeast regions and in the capitals and in all types of cities in the country. On the other hand, there was no statistically significant change at the extremes of education and income ( $p>0.05$ ) (Table 3).

With regard to women, the growth was statistically significant ( $p<0.05$ ) at all ages, in all racial groups (except

other), in number of household residents, in employment status and participation in religious activities. It was also significantly greater among residents in the Southeast and Northeast regions, and in all types of cities in the country. On the other hand, the lack of statistically significant change continued at the extremes of education and at the highest income level ( $p>0.05$ ) (Table 4).

**Table 3. Prevalence of depressive symptoms according to socioeconomic and demographic in Brazilian young adult men (18 to 24 years) interviewed in the National Health Survey (PNS) 2013 (n=3,467) and 2019 (n=3,800), Brazil.**

Variables	Prevalence of depressive symptoms				Absolute change in prevalence 2013-2019		p-value*
	2013		2019		2013-2019		
	%	95%CI	%	95%CI	%	95%CI	
Age group (in years)							
18 to 20	2.4	1.2; 3.6	7.8	5.4; 10.1	5.4	4.1; 6.7	0.001
21 to 24	3.3	2.1; 4.5	5.2	3.3; 7.0	1.9	0.1; 2.9	0.09
Color/race							
White	2.5	1.2; 3.8	6.6	4.8; 8.5	4.1	3.0; 5.5	0.001
Black	3.3	2.1; 4.5	6.0	3.9; 8.1	2.7	0.3; 5.3	0.03
Other	0.0	0.0; 0.0	2.4	-1.6; 6.4	2.4	-3.0; 12.5	0.40
Residents in household							
One	3.8	1.1; 6.5	5.9	2.0; 9.8	2.1	-3.2; 8.3	0.36
Two	2.4	1.4; 3.5	8.1	4.0; 12.1	5.7	3.3; 8.1	0.001
Three or more	3.0	1.9; 4.0	5.9	4.2; 7.7	2.9	2.1; 3.9	0.003
Religious activities							
Yes	3.5	1.7; 5.3	6.6	3.5; 9.7	3.1	0.1; 4.6	0.07
No	2.6	1.7; 3.5	6.0	4.3; 7.8	3.4	2.4; 4.4	0.001
Works							
Yes	2.7	1.7; 3.6	5.1	3.6; 6.7	2.4	0.6; 4.4	0.009
No	3.4	1.7; 5.1	8.1	5.2; 11.0	4.7	1.3; 8.4	0.007
Education							
Incomplete elementary school		2.5; 6.3	7.6	2.5; 12.8	3.3	0.0; 5.4	0.19
Complete elementary school to incomplete high school	1.8	0.8; 2.9	6.0	3.5; 8.4	4.2	2.7; 5.6	0.001
Complete high school to incomplete higher education	2.7	1.3; 4.0	6.3	4.1; 8.5	3.6	2.5; 4.8	0.005
Complete higher education	5.8	-3.3; 14.9	2.1	0.2; 3.9	-3.9	-7.8; 0.0	0.25
Per capita household income (MW)							
No income up to 1/2	3.5	1.3; 5.6	7.2	3.4; 11.0	3.7	0.1; 5.6	0.13
More than 1/2 up to 1	3.4	1.8; 4.7	7.4	4.9; 10.0	4.0	2.5; 5.7	0.007
More than 1 up to 2	2.5	1.0; 4.0	4.7	2.4; 6.9	2.2	0.2; 3.6	0.11
More than 2 up to 3	2.6	0.2; 5.3	4.2	1.1; 7.3	1.6	-1.1; 4.3	0.46
More than 3	1.6	0.3; 2.9	4.0	0.7; 7.3	2.4	0.0; 5.0	0.11
Macroregion of country							
North	3.3	1.2; 5.5	4.3	2.6; 6.0	0.9	-1.4; 3.6	0.48
Northeast	2.9	1.4; 4.3	6.7	4.5; 8.8	3.8	2.3; 5.4	0.004
Central-West	3.6	1.2; 6.1	7.1	2.6; 11.6	3.5	0.3; 6.8	0.15
Southeast	3.2	1.5; 5.0	7.0	3.9; 10.1	3.8	2.5; 5.2	0.03
South	1.5	0.5; 2.5	3.8	1.5; 6.1	2.3	0.2; 4.2	0.05
Type of city							
Capital and metropolitan region	3.7	2.5; 4.9	6.7	4.9; 8.4	3.0	0.9; 5.2	0.001
Countryside	2.4	1.1; 3.6	5.9	3.7; 8.1	3.5	2.5; 4.6	0.005

\*Pearson  $\chi^2$  test. 95%CI: 95% confidence interval; MW: minimum wage.

**Table 4. Prevalence of depressive symptoms according to socioeconomic and demographic characteristics in Brazilian young adult women (18 to 24 years) interviewed in the National Health Survey (PNS) 2013 (n=4,356) and 2019 (n=4,247), Brazil.**

Variables	Prevalence of depressive symptoms				Absolute change in prevalence 2013-2019		p-value*
	2013		2019		%	95%CI	
	%	95%CI	%	95%CI			
Age group (in years)							
18 to 20	6.8	5.1; 8.4	16.9	13.1; 20.8	10.1	8.4; 12.1	0.001
21 to 24	9.5	7.6; 11.3	14.6	12.3; 16.9	5.1	3.5; 6.8	0.001
Color/race							
White	7.1	5.1; 9.2	14.9	11.3; 18.4	7.8	5.9; 9.5	0.001
Black	9.0	7.3; 10.7	15.7	13.3; 18.2	6.7	3.8; 10.1	0.001
Other	13.2	1.5; 24.9	26.3	-3.3; 55.9	12.9	1.0; 25.0	0.36
Residents in household							
One	7.7	2.2; 13.2	19.6	10.9; 28.3	12.0	2.3; 22.7	0.02
Two	8.0	5.4; 10.7	15.5	11.2; 19.8	7.5	4.3; 10.7	0.002
Three or more	8.3	6.8; 9.8	15.5	13.1; 17.9	7.2	5.8; 8.5	0.001
Religious activities							
Yes	9.0	7.1; 11.0	14.3	11.1; 17.5	5.3	3.4; 7.0	0.005
No	7.5	5.7; 9.3	16.5	13.8; 19.3	9.0	7.4; 10.8	0.001
Works							
Yes	8.9	6.7; 11.1	16.3	12.8; 19.8	7.4	3.3; 12.1	0.001
No	7.7	6.0; 9.3	14.9	12.5; 17.4	7.2	4.4; 10.8	0.001
Education							
Incomplete elementary school	12.8	8.8; 16.8	18.2	11.9; 24.5	5.4	0.2; 9.4	0.14
Complete elementary school to incomplete high school	8.6	5.9; 11.3	21.1	15.8; 26.3	12.5	9.7; 15.2	0.001
Complete high school to incomplete higher education	7.2	5.6; 8.9	14.2	11.7; 16.8	7.0	5.5; 8.6	0.001
Complete higher education	6.5	2.0; 11.0	7.8	4.1; 11.4	1.3	-2.3; 5.0	0.68
Per capita household income (MW)							
No income up to 1/2	9.5	7.1; 11.8	14.7	11.9; 17.6	5.2	3.0; 7.6	0.001
More than 1/2 up to 1	7.6	5.3; 9.8	16.6	12.7; 20.5	9.0	6.8; 11.3	0.001
More than 1 up to 2	8.3	5.9; 10.8	16.9	12.5; 21.4	8.6	6.2; 11.1	0.001
More than 2 up to 3	4.4	1.9; 6.9	17.0	4.9; 29.1	12.6	8.0; 17.6	0.002
More than 3	9.5	3.1; 15.9	7.3	3.0; 11.7	-2.3	-6.5; 1.8	0.58
Macroregion of country							
North	9.0	6.1; 11.9	12.6	9.5; 15.7	3.6	0.0; 7.7	0.10
Northeast	7.0	5.3; 8.7	14.4	11.8; 17.0	7.4	5.2; 9.6	0.001
Central-West	10.9	7.1; 14.7	14.1	9.3; 18.9	3.2	-1.1; 7.9	0.30
Southeast	7.7	5.4; 10.1	18.0	13.6; 22.3	10.3	8.3; 12.3	0.001
South	10.4	5.6; 15.3	13.8	9.8; 17.8	3.4	0.1; 6.8	0.31
Type of city							
Capital and metropolitan region	8.2	6.7; 9.8	17.7	14.6; 20.9	9.5	6.2; 13.9	0.001
Countryside	8.3	6.3; 10.3	13.9	11.2; 16.6	5.6	4.1; 7.2	0.001

\*Pearson  $\chi^2$  test. 95%CI: 95% confidence interval; MW: minimum wage.

## DISCUSSION

The results showed a statistically significant increase in the prevalence of depressive symptoms in young Brazilian adults, especially in women, suggesting an increase in dis-

tress and worsening of the quality of mental health during the period evaluated. These results are consistent with global, regional and country estimates and profiles that indicated an increase in mental health problems<sup>2-4</sup>. They also indicate an unfavorable relationship with age, female sex

and vulnerable racial and socioeconomic groups<sup>7,8,10-16,30</sup>. These findings reveal the importance of analyzing the mental health of the population in late adolescence and early adulthood.

The prevalence of depressive symptoms observed in this study may result in harm to the social, school and work life of young people, since mental health problems are highly persistent and have repercussions throughout their life. Socioeconomic, cultural, and political changes in life dynamics and exposure to stressors — such as poverty<sup>31-34</sup>, urban violence<sup>35-37</sup>, stigma<sup>32,38</sup>, lack of social support networks<sup>35,39,40</sup> and health care<sup>41-43</sup>, as well as excessive screen time<sup>44-46</sup> — have been linked to worsening mental health. The lack of protective factors that strengthen resilience — skills, individual socioemotional attributes, positive social interactions, quality education, decent work, safe neighborhoods, and community cohesion — can make negative feelings chronic, especially those associated with depression<sup>30,47</sup>. Thus, mental health policies should be the focus of crosscutting public interventions, favoring the diagnosis and early intervention of health problems and promoting the reduction of associated morbidity and mortality<sup>48</sup>.

In all countries, mental health conditions (including depression, anxiety and stress) are increasingly prevalent and vary according to sex, age and life stages<sup>2,11,19,20,22,49</sup>. In this study, the greater increase in the prevalence of depressive symptoms at younger ages (18 to 20 years) suggests greater vulnerability to environmental and psychosocial events, as demonstrated in the literature<sup>50-52</sup>. Young people have a strong desire for self-confidence and to safeguard their own health, and support structures are often considered inaccessible and insensitive<sup>53</sup>. Furthermore, possible overlapping academic and work demands can amplify physical and emotional exhaustion in young people and induce depression<sup>7,20</sup>.

Globally, women have worse levels of mental health and are more exposed to disorders such as depression and anxiety<sup>4,5,13,18,19</sup>. It was found that women had a higher prevalence and absolute change in having depressive symptoms, with a pattern of socioeconomic and demographic characteristics that amplified this reality. Some hypotheses for this association would be that women may be exposed to factors (poverty, gender-based violence, accumulation of multiple demands and social responsibilities) that can overwhelm them<sup>17,19</sup>. In fact, they tend to have a worse perception of their mental health than men, use more health services and may have a more refined understanding of their own general health status than men<sup>5,7,12,17,19,54</sup>.

This study showed that the prevalence of depressive symptoms varies according to socioeconomic vulnerability. The reasons for this are attributed to the fact that people with the lowest levels of education and income are more exposed to situations of stress and stigma; work in unstable and precarious jobs; and live in vulnerable areas with deprivation in community infrastructure<sup>2,20,30</sup>. Social suf-

fering and structural inequities feed a sense of socio-community, socioeconomic and productivity insecurity, which generates worse self-perception of health and mental well-being.

The influence of color/race on the presence of depressive symptoms was also observed. Racial and ethnic inequalities in mental health have also been described in studies conducted in other countries, regardless of income level and age<sup>7,11,12,15,19,20,30,54</sup>. In general, blacks, immigrants and natives of ethnic minority groups presented high prevalences of depression, substance abuse and suicide. In Brazil, black people have always had lower levels of physical, socioeconomic and health indicators<sup>55</sup>. The maintenance of socioeconomic exclusion, abandonment, disinvestment and racial discrimination have exposed these groups to a set of stresses and mental disorders, especially for women<sup>32,56</sup>. The intersection between race and sex generates overlapping exposure to worse access to social and mental health services and care, leading to worse levels of mental health and depression in black women.

In this study, there was a variation in the prevalence of depressive symptoms according to the condition of participation in religious activities and the composition of the number of residents in the household. Religious practice and interpersonal and family relationships are social determinants of health and can promote mental health and resilience in individuals<sup>2</sup>. Social interactions can encourage individuals to engage in health-promoting behaviors and use more health services<sup>56</sup>. However, low or no interaction with other people in religious activities can suppress social and family dynamics thought to facilitate health and mental well-being<sup>2,56</sup>.

Evidence shows a greater presence of depressive symptoms in large regions and areas of the country, which are home to socioeconomic inequalities and inequalities in access to health services, sanitation and urban infrastructure<sup>55</sup>. Variations in the prevalence of depressive symptoms were also observed between regions and types of cities in Brazil. This prevalence increased between the two PNS in regions with larger populations (South-east) and greater socioeconomic and health inequalities (Northeast) of the country. These results suggest that the physical and social characteristics of these places expose their residents to factors that are known to deteriorate mental health<sup>2,55</sup>.

Variation by sex in the prevalence of depressive symptoms was observed between cities in the country. Men living in capital cities and metropolitan regions had a statistically significantly lower increase than women in all cities. A meta-analysis reported a 2.37% higher risk of schizophrenia for people living in urban environments compared to rural environments<sup>57</sup>. Reasons for the results observed here stem from continued urbanization, which increases exposure to mental health risk factors, especially among women<sup>58</sup>. The relationships that induce depressive symp-



toms that women tend to deal with are structural and independent of the type of city.

Mental health is a global public good and a fundamental right for all. However, the results of this study indicated variations in its scope among different population subgroups. The growth in the prevalence of depressive symptoms in young Brazilians over the years was found to be unfavorable and heterogeneous, with women being the most affected group. The difficulties young adults have in dealing with the stresses and demands of life affect their mental health and highlight the challenges for screening and managing these stresses to ensure a reduction in the growth of depressive symptoms and associated future problems. The results highlighted the prevalence of depressive symptoms among young adults according to socioeconomic and demographic aspects in both sexes and compared their evolution between 2013 and 2019. The PNS data were useful for monitoring the reality of the presence of these symptoms in the country and can contribute to intersectoral public policies and transversal mental health programs that assist in the early and population-based screening of the population most vulnerable to mental health problems and their psychosocial consequences, avoiding a chronic cycle of adversity and disabilities throughout life.

Despite the aforementioned results, this study had limitations. The PNS is a cross-sectional and sample survey and does not allow for the presence or absence of the symptoms assessed over time for the same individuals. The PNS did not include an institutionalized population, and recall bias may have affected the results. In this study, we chose to analyze the young population aged 18 to 24. Although this cutoff point is different from that used in studies on adolescence, this age range is used in several countries, since untreated mental health problems in early adulthood can increase the risk of serious and lasting mental health problems later on.

It is also possible that difficulties in interpreting the questions among the interviewees may have changed the answers they gave and, therefore, the estimates obtained. The questions used to estimate the prevalence of depression symptoms in the PHQ-9 in the PNS are operationally simpler and easier to use in epidemiological surveys than individual clinical methods. They also refer to what was self-perceived in the two weeks prior to the interview, which is different from surveys that estimate mental disorders in a 12-month period<sup>12</sup>.

The PHQ-9 with a cutoff point of 10 classifies depression with sensitivity (77%) and specificity (85%) that may imply classification error<sup>10</sup>. However, the PHQ-9 is a standardized and internationally accepted questionnaire for screening mental health, allowing the results to be compared with international studies and the referral of actions to groups identified early. In the period between the two PNS, Brazil underwent major socioeconomic, cultural and

political changes; therefore, analyses of the results should consider these changes and their effects on the findings presented. However, the PNS has national scope, and its data represent an opportunity to compare, throughout the second decade of the 21st century, symptoms of population screening for depression in Brazil, identifying — in both sexes — the population groups and locations that most need attention to achieve more adequate levels of mental health promotion in the country.

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## RESUMO

**Objetivo:** Estimar a prevalência de sintomas depressivos na população de 18 a 24 anos, segundo aspectos socioeconômicos e demográficos no Brasil, comparando sua evolução entre os anos de 2013 e 2019. **Métodos:** Estudo transversal realizado com dados secundários da Pesquisa Nacional de Saúde 2013 e 2019. Foram incluídos 7.823 adultos jovens (18 a 24 anos) de 2013 e 8.047 de 2019. O instrumento utilizado para avaliar a depressão foi o *Patient Health Questionnaire-9* (PHQ-9). Todas as estimativas incluíram os pesos da população e a amostragem complexa. **Resultados:** A prevalência de sintomas depressivos quase dobrou: 10,9% (IC95% 9,6–12,2) em 2019, ante os 5,6% (IC95% 4,8–6,4) em 2013; uma diferença absoluta de 5,3% (4,5–6,0) maior. As mulheres foram as mais afetadas em ambos os inquéritos, com aumento entre 2013 (8,3%; IC95% 6,9–9,6) e 2019 (15,6%; IC95% 13,5–17,6) superior aos dos homens (2013: 2,9%; IC95% 2,0–3,8 e 2019: 6,2%; IC95% 4,7–7,7). Em ambos os sexos, o padrão de aumento foi maior para os grupos de 18 a 20 anos; não participantes de atividades religiosas; que estavam nos mais baixos níveis de escolaridade e renda; que residiam com duas ou mais pessoas; e que residiam nas regiões Nordeste, Sudeste, capitais e áreas metropolitanas do país. **Conclusão:** Verificou-se aumento estatisticamente significativo da prevalência de sintomas depressivos ao longo dos 6 anos dos inquéritos. Esse aumento não ocorreu de modo homogêneo entre as características analisadas, indicando os grupos populacionais e localidades do Brasil em que mais cresceu a presença desses sintomas no período.

**Palavras-chave:** Inquéritos de saúde. Saúde mental. Depressão. Efeito psicossocial da doença. Adulto jovem.

**ETHICAL ASPECTS:** The 2013 and 2019 PNS data are in the public domain and can be used according to the research of interest. In both years, the PNS was approved by the National Research Ethics Commission (CONEP)/National Health Council (CNS) (in 2013: Opinion No. 328,159 and CAAE: 10853812.7.0000.0008, dated 06/26/2013; in 2019: Opinion No. 3.529.376 and CAAE: 11713319.7.0000.0008, dated 08/23/2019), and all participants signed an informed consent form.

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