Research Article

Prevalence of depression and factors associated with Brazilian workers

Abstract

Objective: To describe the prevalence and analyze the factors associated with depression related to workers in Brazil.

Methods: cross-sectional analysis, which used data from the National Health Survey, which took place in 2013. The variables analyzed were gender, age, skin color, education, smoking, sleep deprivation, country region and occupation. Descriptive measures were taken as prevalence of the injury and association with odds ratio.

Results: the prevalence of aggression was 6.2% among workers and the categories most related to women, aged from 40 years, higher education level, smokers, southern region of the country and occupations of health, trade and repair and basic sanitation.

Conclusion: of the categories associated with the outcome of some confirmed literature, and others in particular, such as branches of economic activities, use of new studies for better elucidation as a factor associated with depression in workers.

Keywords: prevalence, depression, epidemiology, occupational health, population

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Abbreviations: NHS, national health survey; MH, ministry of health; PPH, permanent private homes; PDAs, personal digital assistance; NCEA, national classification of economic activities; OR, odds ratio; IBGE, Brazilian institute of geography and statistics

Introduction

The social and labor demands inherent in human development have, to some extent, always contributed to the physical and emotional strain of the population in general. Transformations in the socioeconomic model have contributed to increased competitiveness, which requires greater productive capacity and thus increasing the risk of illness, especially in the occupational field.[1] Several studies have concentrated efforts to understand the influence of work on workers' illness, both regarding physical and mental illnesses.[1–7] From a psychological point of view, depression, along with anxiety and stress, has been highlighted among work-related mental disorders. This is due to the increased number of cases and the resulting impacts on both the sick individual and the employer as well as and society as a whole. The depression is currently estimated to affect about 322 million people worldwide, being the leading cause of disability on the planet, with serious impacts on the world of work, as much of the prevalence is concentrated in the productive population Brazil is the Latin American country with the highest prevalence of cases in the general population, around 11.5 million Brazilians.[3,8]

The depression is considered a chronic disease with high recurrence rates. It is estimated that approximately 60% of people who have an episode of depression have the symptoms repeated at least once in their lifetime. The data is clinically relevant since recidivism interferes with the health and quality of life of the patient, contributes to social isolation, affects their productive capacity and impairs their maintenance in the labor market.[1,2] In addition, symptoms related to

cognitive problems such as difficulty concentrating, distractions, memory loss, and difficulty performing daily tasks,[1] as well as psychosomatic, neurological symptoms, feeling of sadness, mood loss, thoughts, and suicide attempts contribute to for low productivity and premature death in people with depression.[8] This is due to the association with other health problems and, in more severe cases, to death by suicide, increasing the economic impact of this disease.[9]

The etiology of depression is considered multicausal and involves both physiological and psychological factors.[5] However, studies show that, when it comes to worker health, occupation and organizational factors may influence its occurrence or aggravate its symptoms when pre-existing disease.[2,10] However, it is noteworthy that, regardless of the causes or risk factors, depression is a treatable and often preventable disorder.[1,9] Thus, disease prevention and health promotion actions should be priorities both globally and in the workplace. However, health promotion and disease prevention actions should always be guided by indicators that express reality and direct actions. In front of the exposed and considering that Brazil currently has approximately 105 million economically active people,[11] it is necessary to study with a comprehensive and representative sample plan of the population residing in the country to analyze the event of depression in workers. Thus, the objectives of this study are to describe the prevalence and to analyze the demographic and occupational social factors associated with self-reported depression in Brazilian workers in 2013.

Methods

This is an epidemiological cross-sectional population-based study conducted in Brazil in 2013, the prevalence of which was a lifetime analysis. The micro data were used from the National Health Survey (NHS) conducted by IBGE in partnership with the Ministry of Health (MH).[12] The research participants were residents of permanent private

households, living in both urban and rural areas, whose coverage area was the entire territory of Brazil.

The PNS data were obtained from a complex sampling plan, with multiple selection clusters, as follows: 1st stage (UPA) - census tract or set of census tracts (with at least 60 Permanent Private Homes-PPH), with probability of selection proportional to the number of PPH; 2nd stage - selection by simple random sampling of households in each UPA; 3rd stage - simple random sample selection of a resident 18 years of age or older per household.[12] Data collection through interviews was performed by properly trained interviewers, with the help of PDAs (Personal Digital Assistance), handheld computers, properly programmed for the critical processes of variables.[12]The dependent variable was assessed by applying the following research question: "Has any physician or mental health professional (such as a psychiatrist or psychologist) already diagnosed you with depression?" (Yes/no).[12]

For this study, the independent variables selected were socio-demographic, lifestyle and occupational variables: gender (male, female); age group (≤29 years, 30 - 39 years, 40 - 49 years, 50 - 59 years, ≥60 years); skin color (white and non-white); educational level (uneducated, elementary school, high school, and higher education), smoking (yes/no), sleep deprivation (yes/no). Residence that was categorized by region of the country (north, northeast, southeast, south and midwest).The classes of the National Classification of Economic Activities (NCEA) were divided into 12 categories: agriculture; transformation industry; sanitation and the like; construction; trade and repair; transport and storage; accommodation, food and communication; administrative services (financial, administrative, real estate, professional, scientific and technical activities); education, arts, culture and sport; domestic services; others (mining, electricity, gas, and international organizations).Regarding the data analysis, it was initially descriptive with the population projection of the sample based on the necessary weights. Absolute and relative frequencies of categorical variables were made, in addition to the 95% confidence interval. For age, the mean and interquartile range were calculated.

As this is a "rare" prevalence event in this study, for the univariate analysis, the Odds Ratio (OR) with the Logistic Regression was performed to obtain the effect measure for association with 95% CI between the dependent variable (self-reported depression) and the independent variables (gender, age, skin color, level of education, region of the country, smoking, insomnia and NCEA), considering significant p<0.05.After univariate analysis between the dependent variable and the independent variables, the adjusted analysis with the Logistic Regression was performed. The multiple analysis was of stepwise forward type, being included in the multiple model the variables with p<0.2 by the maximum likelihood method in the univariate analysis, considering significant p<0.05. It was found that the final logistic model obtained the appropriate fit (p>0.05) by Archer and Lemeshow's goodness-of-fit test.The analyzes were performed in the survey module of Stata software version 12.1 (StataCorp., CollegeStation, United States), taking into account the research weights. Records of non-economically active persons under 18 years of age were excluded. The final sample after the exclusions were 36.187 people. This study did not require approval by the ethics committee as it were conducted from a public domain secondary data source (PNS), available online from the Brazilian Institute of Geography and Statistics (IBGE). There was no identification of the research participants, ensuring anonymity.

Results

In 2013, the projection of workers in Brazil was 89.481.382. The mean age was 38.8 years and the interquartile age range was 18 to 90 years. The predominant categories were male, with 57.1% (95% CI: 56.2; 58.1); less than or equal to 29 years, with 27.9% (95% CI: 26.5; 28.1); non-white, with 51.8% (95% CI: 50.1; 52.8); high school, with 37.8% (95% CI: 36.9; 38.8); non-smokers, with 84.7% (95% CI: 84.0; 85.3); from the southeast region, with 43.9% (95% CI: 42.9; 44.8) (Table 1).With regard to depression, the prevalence was 6.2% (95% CI: 5.8; 6.7) in the working population, and the groups with the highest proportions were female workers (10.2%); age from 40 to 49 years (8.2%) and 50 to 59 years (8.2%); whites (7.4%); with higher education (7.5%); smokers (8.1%); from the southern region of the country (10%) (Table 2). The average age of workers with depression was 42.3 years.In the univariate analysis, the categories most associated with the outcome were females, with an OR of 3.11 (95% CI: 2.63; 3.66); age group from 40 to 49 years old, with OR of 2.38 (95% CI: 1.87; 3.03) and from 50 to 59 years old, with OR of 2.38 (95% CI: 1.83; 3.05). Also in relation to age, an OR of 1.02 per year of increase was observed (95% CI: 1.01; 1.03; p <0.001). There was also a greater association among white workers, with OR of 1.43 (95% CI: 1.24; 1.64); higher education, OR of 1.68 (95% CI: 1.24; 2.21); smokers, OR of 1.37 (95% CI: 1.15; 1.63); from the south of the country, OR of 4.00 (95% CI: 3.22; 4.98) (Table 3)and (Table 4).The variables that maintained an independent effect on the multiple analysis were gender, age, education, smoking, region and ANC. During the modeling process, the variables that best fit the final model were the region of the country that exerted adjustment especially on skin color and education. Gender adjusted for NCEA and education, and insomnia mainly adjusted for gender and age.

Table I Characteristics of workers according to the variables gender, age, skin color, educational level, smoking and region of the country. Brazil, 2013

Variable	Population	% (CI95%)	Depression % (CI95%)
Sex			
Male	51.132.079	57,1 (56,2; 58,1)	3,3 (2,8; 3,8)
Female	38.349.303	42,9 (41,9; 43,8)	10,2 (9,4; 11,0)
Age range			
≤29 years	24.943.750	27,9 (27,0; 28,7)	3,4 (2,8; 4,2)
30–39 years	24.423.270	27,3 (26,5; 28,1)	6,0 (5,3; 6,8)
40–49years	19.651.156	22,0 (21,2; 22,7)	8,2 (7,2; 9,4)
50–59years	14.517.101	16,2 (15,5; 16,9)	8,2 (7,0; 9,6)
≥60years	5.946.104	6,6 (6,2; 7,1)	7,4 (5,7; 6,7)
Skin color			
No white	46.314.320	51,8 (50,1; 52,8)	5,2 (4,7; 5,7)
White	43.167.062	48,2 (47,2; 49,2)	7,4 (6,7; 8,1)

Table Continues...

Variable	Population	% (CI95%)	Depression % (CI95%)
Educational level			
Unread	7.797.851	8,7 (8,2; 9,2)	4,5 (3,5; 5,6)
Elementary school	28.326.186	31,7 (30,7; 32,7)	7,1 (6,3; 8,0)
High school	33.870.502	37,8 (36,9; 38,8)	5,2 (4,5; 5,9)
Higher education	19.486.842	21,8 (20,7; 22,8)	7,5 (6,5; 8,7)
Smoking			
No	75.784.552	84,7 (84,0; 85,3)	5,9 (5,4; 6,4)
Yes	13.696.830	15,3 (14,7; 16,0)	8,1 (6,9; 9,5)
Region			
North	6.505.346	7,3 (6,9; 7,5)	2,5 (2,1; 3,0)
Northeast	22.213.654	24,8 (24,1; 25,6)	4,1 (3,6; 4,7)
Southeast	39.261.297	43,9 (42,9; 44,8)	6,7 (5,9; 7,6)
South	14.431.967	16,1 (15,5; 16,7)	10,0 (8,8; 11,4)
Midwest	7.069.118	7,9 (7,6; 8,2)	6,2 (5,3; 7,2)

(CI95%): confidence interval of 95%

Table 2 Characteristics of workers according to the variables sleep deprivation and National Classification of Economic Activities. Brazil, 2013

Variable	Population	% (CI95%)	Depression (CI95%)
Sleep deprivation			
No	66.136.981	73,9 (73,0; 74,8)	3,7 (3,3; 4,2)
Yes	23.344.401	26,1 (25,2; 26,9)	13,3 (12,2; 14,6)
NCEA			
Transport and storage	3.998.018	4,5 (4,1; 4,9)	2,3 (1,6; 3,8)
Agriculture, fishing and livestock	9.796.299	10,9 (10,3; 11,6)	4,9 (3,8; 6,4)
Transformation industry	10.841.493	12,1 (11,4; 12,8)	5,9 (4,8; 7,2)
Sanitation	773.887	0,9 (0,7; 1,1)	7,8 (3,3; 17,4)
Construction	7.777.603	8,7 (8,1; 9,3)	3,9 (2,6; 5,7)
Trade and repair	17.798.200	19,9 (19,1; 20,7)	5,7 (4,8; 6,8)
Accommodation, food and communication	5.195.833	5,8 (5,4; 6,2)	6,1 (4,7; 7,9)
Administrative services	14.266.974	15,9 (15,2; 16,6)	6,2 (5,2; 7,3)
Education, arts, culture and sport	6.652.276	7,4 (6,9; 7,9)	9,6 (7,6; 12,0)
Health and social services	5.744.611	6,4 (5,9; 6,9)	9,2 (7,4; 11,5)
Domestic services	6.043.835	6,8 (6,3; 7,3)	10,0 (8,2; 11,5)
Other services #	593.352	0,7 (0,5; 0,8)	0,7 (0,1; 4,5)

#mining, electricity, gas, and international organizations
(CI95%): confidence interval of 95%

Table 3 Crude and adjusted analysis of depression for the variables gender, age, skin color, education level, smoking and region of the country Brazil, 2013

Variable	ORb(IC95%)c	p - value	ORa(IC95%)c	p - value
Sex		<0,0001**		<0,0001**
Male	1		1	
Female	3,34 (2,81; 3,98)	<0,001*	2,99 (2,46; 3,63)	<0,001*
Age range		<0,0001**		
≤29 years	1		1	
30 – 39 years	1,79 (1,40; 2,30)	<0,001*	1,71 (1,33; 2,20)	<0,001*
40 – 49years	2,50 (1,94; 3,23)	<0,001*	2,14 (1,64; 2,78)	<0,001*
50 – 59years	2,50 (1,92; 3,26)	<0,001*	2,10 (1,60; 2,76)	<0,001*
≥60years	2,23 (1,57; 3,17)	<0,001*	2,09 (1,43;3,05)	<0,001*
Skin color		<0,0001**		
No white	1		1	
White	1,46 (1,26; 1,69)	<0,001*	1,12 (0,95; 1,33)	0,174*
Educational level		<0,0001**		
Unread	1		1	
Elementary school	1,63 (1,232; 2,17)	=0,001*	1,54 (1,14; 2,07)	0,004*
High school	1,16 (0,88; 1,53)	=0,299*	1,25 (0,92; 1,70)	0,154*
Higher education	1,74 (1,30; 2,32)	<0,001*	1,51 (1,06; 2,15)	0,023*
Smoking		=0,0004**		
No	1		1	
Yes	1,40 (1,16; 1,69)	<0,001*	1,47 (1,20; 1,80)	<0,001*
Region		<0,0001**		
North	1		1	
Northeast	1,66 (1,32; 2,09)	<0,001*	1,50 (1,18; 1,91)	0,001*
Southeast	2,78 (2,21; 3,49)	<0,001*	2,46 (1,92; 3,15)	<0,001*
South	4,34 (3,44; 5,47)	<0,001*	3,68 (2,83; 4,79)	<0,001*
Midwest	2,55 (2,00; 3,25)	<0,001*	2,31 (1,79; 2,97)	<0,001*

ORb: Crude odds ratio
ORa: Adjusted odds ratio between all the variables
IC95%c: Confidence interval of 95%.
**: Maximum likelihood test
*: Wald test

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Table 4 Crude and adjusted depression analysis for the variables sleep deprivation and National Classification of Economic Activities. Brazil, 2013

Variable	OR[b](CI95%)[c]	p – value	OR[a](CI95%)[c]	p – value
Sleep deprivation		<0,0001**		
No	I		I	
Yes	3,97 (3,42; 4,62)	<0,001*	3,46 (2,97; 4,04)	< 0,001
NCEA		<0,0001**		
Transport and storage	I		I	
Agriculture, fishing and livestock	2,05 (1,21; 3,48)	0,007*	1,60 (0,92; 2,76)	0,094*
Transformation industry	2,47 (1,51; 4,09)	<0,001*	1,65 (0,92; 2,77)	0,060*
Sanitation	3,36 (1,23; 9,18)	0,018*	2,78 (1,02; 7,56)	0,045*
Construction	1,60 (0,87; 2,95)	0,133*	1,74 (0,93; 3,26)	0,082*
Trade and repair	2,39 (1,48; 3,87)	<0,001*	1,77 (1,06; 2,94)	0,028*
Accommodation, food and communication	2,56 (1,50; 4,36)	0,001*	1,46 (0,83; 2,57)	0,193*
Administrative services	2,59 (1,60; 4,22)	<0,001*	1,62 (0,97; 2,73)	0,068*
Education, arts, culture and sport	4,20 (2,52; 6,99)	<0,001*	1,80 (1,00; 3,25)	0,050*
Health and social services	4,00 (2,40; 6,69)	<0,001*	1,83 (1,07; 3,15)	0,030*
Domestic services	4,39 (2,68; 7,17)	<0,001*	1,61 (0,94; 3,15)	0,085*
Other services[#]	0,26 (0,03; 1,98)	0,195*	0,30 (0,04; 2,34)	0,253*

[#]mining, electricity, gas, and international organizations
OR[b]: Crude odds ratio
OR[a]: Adjusted odds ratio between all the variables
IC95%[c]: Confidence interval of 95%.
**: Maximum likelihood test
*: Wald test

Discussion

The prevalence of depression among workers in Brazil in 2013 was 6.2%, the outcome was more associated with female gender, age from 40 years, elementary school level, smoking, southern region of the country and insomnia.The prevalence of depressive disorders in economically active populations may vary globally. In surveys conducted in China with workers from private companies, the prevalence of depressive symptoms was 8.1%,[13] and among rural workers it was 5.9%.[14] In Korea a national survey found 2.7% of depressive disorders.[15]In a national survey in Canada, the prevalence of depressive disorders was 9.9%.[16] In the United Kingdom analyzing depression from a biobank with 172.751 participants the prevalence of depression was 6.4%,[17]corroborating the findings of this study. In surveys conducted in Brazil, the prevalence of depression varied widely, among firefighters in Belo Horizonte, 5.5%,[18]and in Sao Paulo, the prevalence of depressive symptoms was 20% among nursing professionals.[19]

According to a systematic review, prevalence estimates vary substantially from economically more developed countries to less developed ones. These variations between studies can be elucidated by methodological differences, such as the type and representativeness of the population or sampling, validation of the research instrument and statistical accuracy. The distribution of chronic diseases related to human aging and socioeconomic development are other important aspects in the prevalence of depressive disorders.[20]Studies have associated depression with females, both occupational and in the general population.[15,17,21,22]In a study conducted with Chilean workers, the OR of depression was 2.34, similar to the values found here.[22] Women exposed to constant work tensions, low rewards and worse working conditions are more likely to develop depressive episodes, which is more common for women. In addition to the reflection of social inequalities and health inequalities. On the other hand, women are more likely to seek health services, which may, to some extent, overestimate the occurrence of the outcome in relation to men.[22]

Despite the fact that women have gained space in the labor market, the difference in the distribution of tasks, positions, and treatment received by both coworkers and superiors still prevails.[22] Men are often in management and supervisory positions, while women are more likely to perform operational administrative services. Another important aspect to be considered is stressful events such as the daily double shift assumed by women between work and domestic tasks.[23]Apropos the age group, we observed the highest prevalence of depression among workers over 40 years, that's workers with greater difficulty in entering and maintaining in the labor market. This factor can be attributed to the culture and resistance of the recruitment and human resources sectors to admit older workers, whether due to wage issues, disbelief in innovative knowledge or beliefs of work disability at older ages.[24]For skin color, some research has found an association between depression and white workers. However, the racial/ethnic issue alone does not justify this association, this aspect is possibly more related to unfavorable working conditions, chronic health problems, racial, cultural and religious factors that may interfere with and contribute to self-reported emotions. Association.[25–27]

About education level as a factor associated with depression, the literature presents divergent results with positive associations or without confirmed associations.[16,28–30] This divergence can be attributed to the sample size, ethnic differences and economic development of the country where the study is developed.[28] However, it is pertinent to highlight that the level of education is a determining factor for the maintenance and structuring of employment/occupation and economy, and is associated with social class.[28,29,31] The worker with low education level tends to perform manual work, with lower pay, which can cause economic insecurity. In addition, there is a threat to job retention due to high competition for jobs in these less demanding occupations. On the other hand, workers with the highest level of education tend to occupy management positions, with better salaries, more autonomy, but with higher intellectual demands.[28,30,32] Regarding lifestyle variables, smoking and sleep deprivation obtained the highest prevalence of depression in relation to their references. According to a Dutch study, depressive symptoms are more severe in smokers, especially when there is nicotine dependence.[33] Similarly, tobacco use is generally higher in people with depression in the general population.[17] This relationship of dependence occurs because nicotine is a psychoactive substance that acts under neural activity providing mood boost, so that individuals smoke both for the false sense of pleasure and to relieve depressive symptoms.[34] Appurtenant sleep deprivation, in addition to the significant prevalence rate, this was an important variable for adjusting the level of stress regarding gender, especially among females. According to the literature, depression is associated with both short and long periods of sleep. In addition, to revealing different gender patterns with higher rates of suicidal thoughts among men and stress and depressive symptoms among women, disorders directly influenced by female hormones.[35–37]

Regarding the regions of the country, there was a highlight especially for the South and Southeast where there was a greater association with depression. One of the possibilities to elucidate this fact is the hypothesis of climatic seasonality. Because these are cooler places, compared to other regions, there may be differences in depression between seasons.[38] In addition, the fact that Brazil is a country with continental dimensions should also consider the level of socioeconomic development, differences in access to health services, the distribution of diseases, which may differ from region to region, as well as structuring of the work process and predominant economic activity. Concerning economic activity, the greatest association with depression was evidenced in trade and repair, health and social services and sanitation activities. A study conducted in Singapore's general employed population found the highest prevalence of depression among service and sales professionals (7.7%), legislators (6.9%) and professional employees and managers (6.9%).[39]

It is noteworthy that less qualified professionals working in physically demanding activities are more likely to have physical exhaustion, emotional exhaustion and depressive symptoms than other workers.[32,40] In health workers, there are several factors attributed to mental illness. Long daily and weekly working hours, and on-call work, including night work. The shortage of professionals, the consequent request for overtime, work overload and low pay are some of the conditions that may influence this fact.[41] In addition to these situations, specific characteristics of health care scenarios increase the negative effects on workers' performance and health. Developing countries, issues related to institutions such as organization of time, work, scarcity of material resources, budget constraints, inadequate facilities and poor administrative arrangements result in high levels of fatigue and stress among workers.[41] There were limitations in this study, such as reverse causality between outcome and exposure variables, as it is a cross-sectional view. In addition, the outcome in question may have been underestimated, as access to treatment as well as proper diagnosis may not be accessible to all. Study participants answered several questions about depression broadly, not specifically, in addition to general health and other aspects. However, the alternation of topics may have aided the "blind" effect in relation to the study hypotheses between interviewees and interviewers. Ensuring anonymity may have reduced information bias. The sample was representative of the economically active population of Brazil, which makes it possible to draw profiles, generate hypotheses, and to estimate prevalence in a comprehensive manner and associated factors.

Conclusion

This study found an intermediate prevalence of depression among workers in Brazil (6.2%) and lower than in the general population, and compared to the literature. Female gender, age over 40 years, smoking, living in the southern region of the country, and suffering from sleep deprivation were the factors most associated with the outcome in the multiple model. Prospective studies, such as cohort studies with a representative sample, are recommended to better elucidate the associations found in this study. Even perform causal inference analysis on other more specific aspects in relation to work and grievance-specific activities.

Declaration

The authors contributed equally for this research work.

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Conflicts of interest

Author declares that there is no conflict of interest.

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